JPRS 74977

22 January 1980

China Report

SCIENCE AND TECHNOLOGY

No. 22

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 74977	2.	3. Recipient's Accession No.

4. Title and Subtitle
CHINA REPORT: SCIENCE AND TECHNOLOGY, No. 22

5. Report Date
22 January 1980

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Joint Publications Research Service
1000 North Glebe Road
Arlington, Virginia 22201

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address

As above

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains articles, abstracts and news items on national developments in science and technology; and physical, applied and life sciences in China.

17. Document Analysis a. Descriptors

CHINA
National Developments
Chinese Academy of Sciences
Physical Sciences
Applied Sciences
Life Sciences

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 01, 02, 04, 06, 07, 08, 09, 11, 12, 13, 20

18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22161	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 65
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI–Z39.18)

OPTIONAL FORM 272 (4–77)
(Formerly NTIS–35)
Department of Commerce

JPRS 74977

22 January 1980

CHINA REPORT

SCIENCE AND TECHNOLOGY

No. 22

CONTENTS

PAGE

NATIONAL DEVELOPMENTS

Thirty Years of Scientific Developments Reviewed
(Yan Jici; GUANGMING RIBAO, 2 Nov 79) 1

APPLIED SCIENCES

Observing, Learning From Foreign Countries Recommended
(Qian Sanqiang; XIANDAIHUA, Jul 79) 11

Briefs

Improvement in Semiconductor Technology 14
Computerized Automatic Relay System 14
Ultra-High Speed Integrated Circuit 15
Shanghai Aviation Equipment 15

SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

Biographic Information on Scientists 16

ABSTRACTS

AERONAUTICS

HANGKONG ZHISHI /AERONAUTICAL KNOWLEDGE/, No 9, Sep 79 19

ARCHITECTURE

JIANZHU XUEBAO /ARCHITECTURAL JOURNAL/, No 5, Sep 79 30

CONTENTS (Continued) Page

BIOCHEMISTRY

SHENGHUAXUE YU SHENGWUWULI XUEBAO /ACTA BIOCHEMICA ET BIOPHYSICA SINICA/, No 4, Dec 78 38

SHIPPING

JIANCHUAN ZHISHI /KNOWLEDGE OF SHIPS/, No 5, Oct 79 50

SILICATES

GUISUANYAN XUEBAO /JOURNAL OF SILICATES/, No 2, May 79 57

THIRTY YEARS OF SCIENTIFIC DEVELOPMENTS REVIEWED

Beijing GUANGMING RIBAO in Chinese 2 Nov 79 p 3

[Article by Yan Jici [0917 3444 1964], Vice President of the Chinese Academy of Sciences: "Development of Our National Scientific Endeavors Over the Past 30 Years"]

[Text] Today marks the 30th anniversary of the founding of the Chinese Academy of Sciences [CAS]. A look back over the 30-year history of our scientific endeavors, which can provide instructive experience and education, is extremely necessary.

1. Ever since the 4 May Movement, the Chinese people have used science and democracy as the main ingredient of their new cultural movement against imperialism and feudalism, and many patriotic people with noble aspirations have sought the road of "national salvation through science," but under the reactionary regime of that time, scientific endeavors could not develop and this road was impassable. Prior to liberation, those involved in scientific research work numbered only somewhat more than 600 people. Of those forerunners to the CAS, the Central Research Institute and the Beijing Research Institute, had only somewhat more than 200 people in slightly more than 20 research units. Scientific research work was merely window dressing, and scientists struggled under extremely adverse conditions. Modern science and technology was almost nonexistent. Only in the wake of the revolution of the Chinese people did scientific endeavor begin to walk along a broad road of development.

In November 1949 the CAS was established. This was an important landmark in the opening of a new historic period of scientific endeavor in our country. Later on, various departments of government and various regions continued to establish various specialized research organizations to gradually coalesce into a five-part scientific and technical system composed of the CAS, institutions of higher learning, the industrial sector, the national defense sector, and regional scientific research organizations.

Along with the growth of socialist construction in our country, scientific endeavors have accelerated their forward pace. In June 1955 the Mathematics

Department, the Physics Department, the Chemistry Department, the Biology Department, the Earth Sciences Department, the Technical Science Department, and the Philosophy and Social Sciences Department (the predecessor to the present day Chinese Academy of Social Sciences) of the Chinese Academy of Sciences were established, and 233 of our country's foremost scientists were selected to staff these departments. The establishment of these departments allowed the scientists to guide our country's scientific endeavors. In 1956, the first long-range plan for the development of our nation's science and technology was formulated, namely a 12-year plan (1956-1967). Under the organization and leadership of the State Scientific and Technological Commission and with the redoubled efforts of the entire community of scientists and technicians, the main tasks of the 12-year plan were completed 5 years ahead of schedule in 1962. The completion of this long-range plan filled in some important blanks in our nation's science and technology and buttressed certain key basic studies, for example the establishment and development of nuclear energy, radio electronics, semi-conductors, automation, computer technology, jet propulsion and rocket technology, optics and precision instruments; and the enrichment and improvement in such basic sciences as mathematics, astronomy, physics, chemistry, biology, and the earth sciences as well as some technical sciences, all of which had important and far-reaching effects on the development of our country's science and technology and on the acceleration of socialist construction. By way of promoting the timely continued accelerated development of our national scientific endeavors, and in order to correct the adverse effects on scientific endeavors of certain leftist errors that appeared at a certain stage, the "Fourteen Suggestions on the Current Activities of Organizations Involved in Natural Science Research" was formulated in 1961. In 1962, at the All-China Conference of Scientists and Technicians convened in Guangzhou, Comrade Zhou Enlai and Comrade Chen Yi delivered important addresses and, at the same time with the support of Comrade Nie Rongzhen, the second long-range plan was promulgated, i.e., a 10-year plan (1963-1972). By 1965, scientific research organizations had grown to more than 1,600, and the number of people involved in scientific research numbered more than 100,000. Among these were scientific research organizations within the CAS which had grown to a total of 106 employing 22,000 scientific researchers, an expansion by 100 times within a period of 17 years. The number of institutions of higher learning had grown to more than 400. Under the auspices of the China Scientific and Technological Association, more than 50 specialized institutes were established throughout the nation. Mass scientific experiments and movements to popularize science flourished. Our country's science and technology, including some newly developed fields, was narrowing the distance to go in achieving international advanced levels and in some fields it either already approached or had caught up with international advanced levels.

But the road is tortuous. Just as our national scientific endeavors were flourishing, Lin Biao, Chen Boda, the "gang of four" and their cats paws in the scientific and technical world began, in the course of the Great Cultural Revolution, to break and destroy our national scientific endeavors and scientific research organizations. Scientific endeavors suffered an unprecedented catastrophe. Once again the distance between our national science and technology and international advanced levels was increased. In October 1976, when the Party Central Committee under the leadership of Comrade Hua Guofeng smashed at one fell swoop the "gang of four," which was bringing calamity to the country and the people, a springtime in science arrived! At the March 1978 All-China Scientific Conference convened by the Party Central Committee, the great call issued by Comrade Hua Guofeng to "raise the scientific and cultural level of all the Chinese people" clarified in a broad and long-term way the great role of scientific endeavors in socialist modern construction and provided great encouragement to the community of scientists and technicians. Comrade Deng Xiaoping's report profoundly explained that science and technology is a productive force, that the overwhelming majority of intellectuals are already a part of the working class, and it also explained the question of the system of leadership for scientif organizations; it thoroughly clarified the right and wrong lines for the scientific and technical front and pointed the direction for a further formulation of a national policy for science and technology. In his report on a plan and measures for the growth of science and technology delivered at the conference, Comrade Chen Yi set forth the principal targets and key points of an outline plan for the nationwide development of science and technology for the period 1978-1985. Given the encouragement of the scientific conference and mobilization by the entire Party, a fever for great efforts in science arose anew. Many scientific units that had been dispersed were reconstituted. As of the firsh half of 1979, scientific research organizations nationwide numbered more than 2,400 with 310,000 research scientists; institutions of higher learning had grown to more than 600; and nationwide specialized societies belonging to the China Scientific and Technological Association had grown to more than 80. All had become larger than ever before. The broad masses of scientists and technicians, their hearts filled with confidence, strove to achieve each and every task proposed by the scientific conference.

2. In the overall process of the development of science and technology, 30 years is but a blink of an eye, but it was in such a period that the world's science and technology grew and changed with each passing day, advancing by leaps and bounds. Our country's scientific endeavors still lag behind advanced world levels as a result of both the fragile foundation on which they are based and the 10-year catastrophe visited upon their development by Lin Biao and the "gang of four." In short, the areas that are blank or fragile are still fairly numerous, and even though some disciplines have been established, a gap of 10 or 20 years still exists. But it must be pointed out that we have already taken the first steps toward the establishment of our own scientific and technical research system and we have already trained a corps of scientists and technicians, fairly numerous and of definite level who have a considerable number of important scientific research accomplishments to their credit. Our scientific and technical work has made important contributions to the strengthening of our national defense and to the building of a socialist economy, and it has created the conditions for the further development of science and technology. Successful experiments with atomic bombs, hydrogen bombs, and missiles, the launch and recovery of man-made satellites, and the synthesis of insulin collectively symbolize our scientific and technical achievements.

Our nation has a long tradition in mathematics. Since the founding of the People's Republic, pure mathematics has continued to show great growth. Research on the theory of additive numbers and problems of the sieve method and Goldbach's conjecture are noteworthy for their achievements and public recognition both domestically and abroad. Important contributions have been made to the development of topology. Very good accomplishments have been shown in the theory of functions, group theory, differential equations, and functional analysis. In applied mathematics, we independently developed the finite origins method and its theory. Research on information theory, computer theory, mathematical logic, and the theory of probability were built from scratch. Mathematical statistics and operations research have shown great growth. Results were obtained in the extension of optimization and overall planning. Excellent results were obtained in control theory.

Within the past 30 years, new observatories have been built in Beijing, Shaanxi, and Yunnan along with astronomy instrument plants and artificial satellite tracking station networks. Critical needs in the national economy and national defense for service on time shifts, independent compilation of astronomical almanacs, and forecasts of solar activity were developed. Starting with 1963, the precision of our world time service entered the international advanced ranks. Research in solar, astral, and planetary physics and on cosmic studies is gradually getting underway. In recent years a lot of interesting work has been undertaken in theoretical research.

Gratifying results have been obtained in both theoretical and practical work in solid state physics, nuclear physics, high energy physics, optics, and acoustics. Many physicists participated directly or indirectly in the development work on our country's atomic bomb, hydrogen bomb, guided missiles and artifical satellites; even larger numbers made contributions to the development of our country's machine, electron, metallurgy, and instrument manufacturing industries and built from scratch such new industries as our country's atomic energy, semi-conductor industries as well as other aspects of construction of the national economy and national defense. After many years of effort, we now possess the capability to build a large high-energy accelerator and we have begun to build one. In 1959 our country's physicists discovered anti-sigma negative hyperons; in 1966 they proposed the straton-model theory; and in 1972 at the Yunnan cosmic ray station they discovered a heavy particle that may be as much as 10 times heavier than a proton. Recently, the Ding Zhaozhong [0002 5128 0022] group, in which a high-energy physicist from our country was a participant, found experimental proof of the existence of "gluons," and the Moei [5459 3837] group, in which a high-energy physicist from our country was a participant, made significant progress on unified problems bearing on weak interactions and electromagnetic interactions in the course of dispersion experiments on Miaoyi [4924 0001] neutrinos and the elasticity of electrons. These are examples of successes in our international cooperation in science and technology.

Within the last 30 years, many branches of chemistry that had been a blank such as theoretical chemistry, structural chemistry, high polymer chemistry and high polymer physics, organic synthesis, catalytic and element organic chemistry, and colloidal chemistry have been quickly established and developed and have yielded results in research that are remarkable in themselves. Artificial synthesis of insulin and analysis of crystalline structure have attained advanced international standards. Production of jet fuel, petroleum and important catalysts for the chemical industry, synthesis of butadiene rubber and isobutyl rubber, and the synthesis of mica and silicon fluoride materials have made a positive contribution to the modern construction of our nation's industry, particularly to the synthetic rubber industry and the petrochemical industry. At the same time, it has made needed contributions in the supply of new materials for the atomic and hydrogen bombs and for artifical satellites such as solid rocket propellants, fuel cells and solar energy cells, coating materials for temperature control, hydrazine decomposition catalysts for attitude control, and synthetic rubber capable of withstanding high and low temperatures as well as strong oxidizers, plastics, and greases for national defense and modernization construction. In recent years outstanding accomplishments and creative accomplishments have been made in synthetic chemistry, structural chemistry, quantum chemistry, catalysts, rare-earth chemistry and in analysis and separation, such as organic homologous linear laws, extraction of an active center matrix from nitrogen-fixing enzymes, the extraction and separation of rare earths, high-efficiency deoxidation catalysts, high temperature ablation materials and micro-chrome techniques of high efficiency. In the biological field a change has been made in the pre-liberation practice of lopsided emphasis on descriptive research with systematic and practical biological research showing rapid development, and some important but otherwise blank or weak branches of study being either filled in or enhanced. Some important accomplishments have been gained in basic theoretical research on nucleoplasm relationships. At the same time a lot of research work has been done on the combined needs of industry, agriculture, medicine, and national defense. For example, contributions have been made to socialist construction of the motherland in the fields of the utilization of heterosis in hybrids and genetic breeding, in control of locust plagues, biological prevention and control of disease and insect pests, methods to hasten the hatching of fish in hatcheries, propagation of porphyra and kelp, new kinds of micro-organisms for fermentation, weierjiao [3900 3643 5731] and tianjingjiao [3944 5464 5231] extrusion, the principles underlying acupuncture anesthesia and the suppression of pain, the uses of Chinese herbal medicines, a compilation of a survey and diagrammatic representations of biogenic soil resources, as well as the introduction and domestication of the castor silkworm.

In the earth sciences gaps and weak spots were filled in for geophysics, atmospheric physics, marine physics, marine chemistry, marine geology, geochemistry, engineering geology, and hydrological geology. A nationwide comprehensive marine survey and coastal survey was launched. In recent years rather good progress has been made in surveys of the western Pacific, the South China Sea, the East China Sea and of the continental shelf and pollution of the East China Sea. With the construction of a nationwide meteorological observation net, progress has been made in basic meteorological research. Theories on the earth's formation have provided definite theoretical guidance for the development of geology and mineral forecasting. With the virtual completion of construction of a nationwide net of seismograph stations, and in conjunction with mass detection and mass precautions, it has been possible to do a rather good job on predicting earthquakes at Haicheng, Diling, and Songfan. Surveys have been made of the Heilongjaing basin, of Xinjiang, Zinghai, and Menggal, Ningxia, and the mid-reaches of the Yellow River. Natural atlases of the Chinese People's Republic have been compiled. Systematic study has been made of precautions against glaciers and deserts, of permafrost in Qinghai and Xizang and of mud and rock slides in the southwest. In recent years accomplishments have also been recorded in the investigation of the uplifting in the terrain that has taken place in the area of Mount Everest and the high plateaus of Qinghai and Xizang, the reasons for it, and the effects on the natural environment.

In the area of science and technology vigorous efforts have been made, in order to meet the ever increasing needs of both the national economy and national defense, in mining, engineering, in ore dressing, engineering, in metallurgical engineering, electrical and civil engineering, mechanical engineering, in water conservancy and hydroelectric power engineering, as well as in chemical engineering, in engineering thermo-physics, in materials science, in applied dynamics and applied optics, and courses have been added to fill in blanks in new scientific and technical realms such as electronics, computers, semi-conductors, automation, lasers and infra-red, as well as space science and technology, and corrosion and its prevention. Accomplishments in the victorious completion of the great bridge across the Yangtze River at Nanjing, the comprehensive utilization of vanadium, titanium, and magnetite mines and rare earth deposits, the integration of our national resources to develop alloy steel and non-ferrous metals, the successful development of a 12,000-ton hydraulic press, large-scale dihydrate internally cooled electric generators, large-scale electronic computers, large-scale integrated circuits, high resolution electronic microscopes and various large scale optical precision measuring equipment, accomplishments in calculating the three dimensional flow theory for impeller machinery, in the multiple percussion theory for calculating the strength of machine parts, and the breaking theory of metals--all these symoolize the great accomplishments of our research work in technical sciences and have made important contributions to socialist construction.

In the field of agricultural science, our scientists have made great contributions to the development of agricultural production and agricultural science. Examples include the improvement for use of saline, alkaline, and red soils, the breeding of superior varieties of rice, wheat, and cotton and research into the laws governing high yields, the successful breeding of hybrid rice and octopolyploid Xiaohei wheat, the technology of prevention and control of locusts and understanding of the laws governing their occurrence, comprehensive prevention and control of wheat rust and of juice sucking insects, research on the laws governing the over-wintering and migration of army worms, lapinized vaccine of low toxicity for treatment of rinderpest in cattle and swine, diagnosis and immunization technology for infectious anemia in horses, and the use of methane gas in rural villages.

In the fields of medicine and hygiene, many virulent and contagious diseases, parasitic diseases, and local diseases have been virtually eradicated and the incidence and death rate of others has been drastically reduced as a result of breakthroughs in some crucial techniques, diseases such as plague, kala-azar, and Keshan disease. The successful development of the male contraceptive medicine, "cotton phenol" opened a new route for planned births. Following a comprehensive survey, the distribution in our country of malignant tumors was substantially clarified and a collection of maps prepared showing the distribution of malignant tumors in our country. Combined treatment using Chinese and western medicine have produced improved curative effects with coronary heart disease, fractures, and acute abdominal disease and has advanced research in medical theory. Research on Chinese herbal medicines has greatly enriched pharmaceutical resources. Our country was first to succeed with the isolation and culturing of trachoma virus. Major achievements in acupuncture anesthesia, the regeneration of severed limbs, treatment of burns over a large area of the body, the early diagnosis of liver cancer, and surgical treatment of cancer of the esophagus all stand in the international front rank.

2. Looking back on the course of the development of scientific endeavors over the past 30 years, there are experiences to be summarized and lessons to be learned.

In order to have a smooth development of our national scientific endeavors, it was necessary, first of all, to have a secure and united political situation. The fundamental task of scientific research organizations is the production of results, and of qualified personnel, and the promotion of the development of productivity. As scientific research continues, it requires an atmosphere of political stability in which research scientists can dedicate themselves heart and soul to the unflagging production of achievements without being ceaselessly required to carry out political campaigns such as "take class struggle as the key link," or "politics impacts on everything." This is both a very painful lesson learned from the 10-year catastrophe created by Lin Biao and the "gang of four," as well as one that has been repeatedly demonstrated by both positive and negative experiences during the past 30 years.

Secondly, for an accurate class assessment of the ranks of the intellectuals, full reliance should be placed on scientific and technical personnel. Experience demonstrates that the majority of intellectuals in our country, and the majority of scientists and technicians have been a part of the working class for a long time and are a completely reliable force that may be depended upon for the building of socialism. Such a determination following the smashing of the "gang of four," and the adoption of a series of measures served to bring into play their function as leaders and as the backbone of scientific and technical work. This uprooted chaos and put matters to rights; it will have far reaching effects on the future development of scientific and technological endeavors in our country.

Thirdly, for the encouragement of academic democracy, develop a hundred schools of contending thought. In the leadership of scientific and technical work, administrative methods cannot be relied on. Instead, academic leadership can be strengthened in accordance with the laws of scientific and technological development. The principal method for academic leadership is the encouragement of academic democracy and the development of a hundred schools of contending thought.

The natural sciences take as their objective the natural world. Each discipline studies the specific laws of motion of various kinds of matter. Practice is the sole criterion for testing the laws of natural science. One cannot simplistically label various academic views as belonging to a certain -ism or class, much less rely on administrative methods to support a particular school of thought and suppress other schools of thought. Both international and demostic experience demonstrates that to do this is to impede scientific development and is doomed to failure as well.

We must also devote attention to the development of academic exchanges with various countries, assimilate new ideas in learning, and participate positively in international scientific and technical cooperation. The various strictures set up by Lin Biao and the "gang of four" during the Cultural Revolution, the fostering of modern blind faith, the throttling of democracy, and the stifling of science are all lessons that we must never forget.

Fourth, all forces must be coordinated. Forces from all quarters must be organized and work divided and coordinated on the basis of the five key points of the nationwide scientific and technical outline plan and on the basis of the key items in each program for specialized trades and professions so as to overcome much unnecessary overlapping, mutual uncoordination, and going of separate ways. It is necessary to summarize the experiences and lessons of the past, to assimilate the good wasy of doing things from both at home and abroad, to do a conscientious job of reform of the scientific research system, in rules and regulations, and in leadership methods, to arouse enthusiasm everywhere, and to make advances in the deepening and broadening of science and technology.

Fifth, a system of "basic research-applied research-development research" should be established.

Basic research is frequently viewed mistakenly as separating oneself from reality and ignoring it. The principal task of basic research is to explore the basic laws of motion of matter in nature, and to accumulate basic information in the various fields of the natural sciences. Not only is it of great significance for the long-term development of science and technology, but it also has an important function in the development of new technology, in the training of scientists and technicians, and in the improved and more rapid assimilation of strong points from other countries. For these reasons, it is necessary to change the mistaken view of basic research as three separations," (separation from politics, separation from reality, and separation form the masses), to take a longer-range look, to give it the continuous support it requires, and to translate achievements in basic research into applied technology.

Applied research is of numerous kinds and can be directly applied to the solution of problems of a scientific and technical nature in the national economy and national defense. At the moment we are spending greater efforts in its development. We must still strive to strengthen the currently extremely fragile development research (including intermediate testing, generalized testing, and production testing), and to encourage through the economic management system and regulations the active development of scientific research in the production sector, to move out front in applied science accomplishments so as to make science and technology truly become a powerful force in propelling socialist development. What we are saying is that the modernization of science and technology is the key to the realization of the Four Modernizations. Scientific research must precede the development of production, and this objectively reflects the important position of science and technology and points out the laws that objectively exist. Once these laws have been recognized, the full attention and support of all sectors is additionally required and it is necessary to solve in an effective way the numerous intermediate links between science and production, otherwise the development of science will not necessarily promote the development of production.

Sixth, it is necessary to enhance the buildup of the scientific and technical ranks, to improve the conditions of scientific research and the living conditions of scientific research and the living conditions of scientific researchers. The science and technology ranks require not only a proper scale but a proper level as well. For many years, as a result of the lack of rigorous training and in-depth summarization of research work experience, many of our scientists and technicians possess a level far below that required by modern scientific research work. Various effective measures must be adopted to vigorously raise the existing level of the scientific and technical ranks. Vigorous efforts must be made in institutions of higher learning, in middle schools and primary schools to develop a mass movement of scientific experiment that will send a continuous supply of new blood to scientific research organizations. At the present time the scientific instruments and experimental equipment in most research institutes and institutions of higher learning is woefully old and out of date, and the living conditions of research scientists, particularly of young and middle-age scientific research mainstays, is very difficult. These things urgently require improvement.

The road of development of scientific endeavors in our country during the past 30 years has provided us extremely abundant experiences and lessons, both positive and negative. If only we are adept at studying and summarizing these experiences and lessons and make redoubled efforts, our scientific endeavors can have a bright future. CAS president Guo Moru [6753 3106 5387] has said, Only through socialism can science be liberated and only on the foundation of science can socialism be built. Science needs socialism, and socialism needs science even more." Today our motherland is in the midst of a great program to bring about the four modernizations. The modernization of science and technology is the key to the four modernizations. Our comrades on the scientific and technological front must work energetically and plan well to raise our national science and technology with all possible speed and to make a greater contribution to building a modern, socialist power.

9432
CSO: 4008

APPLIED SCIENCES

OBSERVING, LEARNING FROM FOREIGN COUNTRIES RECOMMENDED

Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 3, Jul 79 pp 1-2

[Article by Qian Sanqiang [6929 005 1730], deputy secretary general of the Chinese Academy of Sciences: "Learning, Study, Creativity--Following the Chinese Road to Modernization of Science and Technology"]

[Text] In the past year or two I have had the opportunity to visit several countries for scientific observations and making comparisons. I feel that people have a great many good experiences in developing science and technology. The one most worthy of attention is the practice of carrying out innovation in one's own country through learning and study of the advanced science and technology of foreign countries and following one's own road to modernization of science and technology. Below I will discuss my impressions of two instances, in Australia and Romania.

Dung Beetles as a Research Topic

Australia is a country with vast territory and sparse population. There are many wild animals there, such as kangaroos which are so common that they appear as a symbol on the national emblem. At first, Australia didn't have any cattle, and it wasn't until the English imported 5 cows and 3 bulls 200 years ago that they began to breed in great numbers. After the cattle began to reproduce, nothing could be done with the dung. After many years it hardened and large areas of grazing land became covered with it. At the same time, dung heaps spread diseases through flies which seriously affected the development of animal husbandry, and created a major prlblem in the national economy. Then the Australian entomologists made dung treatment a key research topic. Why was it that cattle dung became a problem but kangaroo dung didn't? After study, the scientists discovered that there is a beetle, called a dung beetle (shikelang [1452 8199 5788] in Chinese) which is partial to kangaroo dung. The beetle rolls the dung into balls which it places in little holes that it digs, then levels the dirt with its feet. It not only uses the dung balls for foot it also lays its eggs in them. In this way the kangaroo dung is scattered and not only does not become a problem but on the contrary becomes good fertilizer for enriching the grass land. However, these local dung beetles were not interested in cattle dung and actually avoided it. The scientists thought that since there are many places in the world with a natural environment like Australia's perhaps there was a dung beetle interested in cattle dung. They went to South America, Africa and the Near East for on-site studies and observations and brought back many dung beetles that like cattle dung. They selected the varieties which could adapt to the natural conditions of Australia, put a great deal of effort into raising and breeding them, then scattered them on the grass land, finally solving the problem of cattle manure and promoting the development of animal husbandry. Our Australian friends say that the dung beetle is one of the important scientific achievements of the past 50 years. From this we can see how intimately connected with considerations of national economic development is the choice of topics for research by Australian scientists. One can also see that when solving difficult problems of developing the national economy, they attach importance to ingenuity as well as looking into and using the laws of nature to achieve their goals.

Development of Computers Depends on Importation and Management

Romania began developing computers in 1966, a decade later than we did. In the beginning, they imported from France a computer that was of moderate level for the time, with a speed of 170,000 calculations per second. They bought not only the computer and its basic software, but also the patent. After they imported it they didn't stop at copying it and using it, but scientists also analyzed, studied and mastered it. Focussing on the defects, they improved it and came up with new ideas, especially after they had improved the software. They developed new software which was more advanced than the French one, shortening the editing time by one-sixth. Then they made their own patent and sold it back to the French, not only recovering the foreign exchange used to buy the patent in the first place, but more importantly, establishing a good foundation for developing personnel trained in computer technology. From this one can see the importance and value of the creative spirit.

Romania's study, design, distribution, management and maintenance of computers has been done very effectively. They carried out a system of division of labor with individual responsibility under national unified leadership. Take computer maintenance for example. They established an Installation and Maintenance Plant in Bucharest, the capital, with 64 maintenance stations nationally to be responsible for computer maintenance throughout the country. If a computer breaks down while in use, once the maintenance station is notified, the computer can generally be put back in operation in an hour or two. Their nation has also decreed that no matter where a computer is sold, the first year it should be used 12 hours a day, after a year and a half that it must be used 18 hours a day and after two years should reach 24 hours a day of operation, demanding that every computer be used by every shift without stopping. There is also a stipulation that computer use rate should be 85 percent and if this rate is not achieved, the state will conduct an investigation and take necessary steps.

These clear stipulations in addition to prompt repair and rational management have brought all positive factors into play so that some computer units have increased the use rate by all means possible. Without waiting for people to come to them, they have gone out looking for users. Speaking only of the units we visited, the effective use rate of Romania's computers has generally reached 90 percent. To spread computer technology and broaden its uses, they have begun to reach computational mathematics languages in the mathematics curriculum in the last two years of high school in Romania and in the universities, both physics and engineering have specialities concerned with computer science and computers.

In the last 10 or so years Romania's computer technology has developed rapidly and is used widely in the national economy as well as in scientific research, greatly increasing labor productivity. For example, after a plant used a computer for economic management, production increased from 3 percent to 20 percent. Romanian scientists believe that the key to computer use and development now isn't the computer itself but its peripheral equipment. To this end they recently concluded an agreement with the United States to use U.S. capital and technology to construct jointly a computer peripheral equipment plant in Romania to promote the faster development of computer technology and further extend its applications.

In comparison, although China began to develop computers earlier than Romania and the calculation speed of the computers China developed itself is ahead of theirs, in terms of computer technology as a whole, for example, computer management, use and systematization, the effective use rate and training of cadres and maintenance, we must admit that we are still rather backward. For a variety of reasons, the speed of our computers frequently cannot be fully utilized. This is not purely a technological question but more importantly is a question of scientific management and comprehensive planning. In this regard, the experience of Romania merits our consideration.

8226
CSO: 4008

BRIEFS

IMPROVEMENT IN SEMICONDUCTOR TECHNOLOGY--China's first ever technological test line for integrated circuits composed of large 75 mm diameter silicon disks was recently set up and put into preliminary operation in the Shang-hai Radio Planet No 7, which has helped to create even better conditions for the development of large-scale integrated (LSI) circuits, thus marking a giant technological step forward in our country's semiconductor production. The LSI disk production line was one of the major items in the city's LSI drive. After it was completed, the technological testing line replaced three original production lines which used to produce ordinary silicor chips. Productivity rose three times over the past. Moreover, with less investment and higher efficiency, it took less time to set the line into operational mode. The successful completion of the LSI technological test line was the result of major coordinative efforts by Fudan University, Research Institute No 1448 of the 4th Machinery Ministry, Plant No 4506, Shanghai Radio Plant No 7, Shanghai Labor Instrument and Meter Plant, Shanghai Radio Machinery Plant, Shanghai Smeltery No 2, and the Measurement and Testing Institute of the Shanghai Municipal Metrological Bureau, which provided the trial development and production of the line with vital equipment, materials and technology, such as large diffusion furnace, wide viewing field photolithographic equipment, large-stroke wafer cutter, large area micro-reducer, and large diameter silicon chips. [Article by Zhang Lixiao [1728 4539 1321] and Chen Zhengyu [7115 2973 0151]] [Text] [Shanghai WEN HUI BAO in Chinese 25 Nov 79 p 1] 9119

COMPUTERIZED AUTOMATIC RELAY SYSTEM--Originally, telegraph messages from Harbin to Hangzhou and Suzhou had to be relayed from Shanghai, and each telegram used to take 38 minutes to be relayed. Now, with the computerized automatic relay system which was successfully developed on a trial basis by the Shanghai Telegraph Bureau, it takes only 3 minutes to relay a telegram. As from July 25 this year, this new type of relay system was introduced into the Shanghai Telegraph Bureau's cable system for intermediate testing. Moreover, it has officially assumed some of the reception and relay work. Preliminary successes have been achieved in some 2 months of actual use. The quality of reception and relay has improved considerably. A total of 480,000 actual telegrams have been relayed, and no failures or errors have occurred. The relay speed is more than 10 times faster than the original speed. [Text] [Shanghai WEN HUI BAO in Chinese 25 Nov 79 p 1] 9119

ULTRA-HIGH SPEED INTEGRATED CIRCUIT--With the full cooperation of Research Institute No 1424 of the 4th Ministry of Machinery and the Shanghai Institute of Metallurgy of the Chinese Academy of Sciences, the Shanghai Radio Plant No 7 undertook the task of developing ultra-high speed integrated circuits in the ECLSE Series, and through more than 1 year's effort, they have come up with 14 differenc IC varieties, some of which have attained the international advanced level of similar products in the 1970's. [Text] [Shanghai WEN HUI BAO in Chinese 25 Nov 79 p 1] 9119

SHANGHAI AVIATION EQUIPMENT--Shanghai, 15 Dec--China's first centralized control tower system has been successfully produced by the Shanghai Xinguang telecommunications factory with support from the Institute of Automation under the Chinese Academy of Sciences. This system will soon be installed in Beijing's international airport. It is composed of 30,000 parts, all manufactured in China. With the new system, the control tower operators are able to keep in touch with over 300 ground installations within a range of 15 km, and operate the equipment there via remote control. With the installation of this new system, the time lapse between the start of the remote control procedure and the return of a signal is slightly over 1 second, while with the old system now in use in China it will take about 30 seconds for a signal to return. [Beijing XINHUA Domestic Service in Chinese 0124 GMT 15 Dec 79 OW]

CSO: 4008

SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

BIOGRAPHIC INFORMATION ON SCIENTISTS

[The following biographic information on selected scientists was extracted from various Chinese-language newspapers as indicated in parentheses at the end of each item.]

Chen Luqi [7115 7120 0967]

Vice chairman of China Forestry Society. (Beijing RENMIN RIBAO 22 Dec 79 p 4)

Cheng Shaojiong [4453 4801 6608]

A 77-year old noted specialist on animal husbandry and veterinary medicine; vice president of Chinese Academy of Agricultural Sciences. (Beijing GUANGMING RIBAO 7 Nov 79 p 2)

Chu Baoyi [5969 5508 0001]

Director of Institute of World Economy, Shanghai Academy of Social Sciences. (Shanghai WEN HUI BAO 12 Nov 79 p 2)

Ding Gongliang [0002 0361 6852]

Vice chairman of Shanghai Municipal Scientific and Technological Committee. (Shanghai WEN HUI BAO 11 Nov 79 p 1)

Feng Depei [7458 1795 1014]

Vice president of Shanghai branch, Chinese Academy of Sciences; concurrently director of its Institute of Biology. (Shanghai WEN HUI BAO 14 Nov 79 p 1)

Guan Zhaozhi [7070 5128 4160], Prof.

Deputy director of Institute of Mathematics, Chinese Academy of Sciences; also honorary professor at South China Engineering College. (Guangzhou NANFANG RIBAO 18 Nov 79 p 3)

Guo Jinghui [6753 2417 6540]

Deputy director of Institute of Geography, Chinese Academy of Sciences. (Beijing BEIJING RIBAO 6 Dec 79 p 4)

He Guangwen [0149 0342 2429]

Vice president of Chinese Academy of Agricultural Sciences. (Beijing GUANGMING RIBAO 9 Nov 79 p 2)

Huang Yaoxiang [7806 5069 4382]

Vice president of Guangdong Provincial Academy of Agricultural Sciences. (Guangzhou NANFANG RIBAO 7 Sep 79 p 1)

Huang Yaozeng [7806 5069 2582]

Deputy director of Institute of Organic Chemistry, Chinese Academy of Sciences. (Shanghai WEN HUI BAO 14 Nov 79 p 1)

Jiang Zhengfan [3068 1767 1581]

Vice chairman of Shanghai Municipal Scientific and Technical Association. (Shanghai WEN HUI BAO 3 Oct 79 p 1)

Pan Shu [3382 5486]

Director of Institute of Psychology, Chinese Academy of Sciences; also chairman of the board of directors, China Psychology Society; on 6 Dec 79 he attended a meeting of a working committee for popularization of psychology sponsored by the China Psychology Society held in Tianjin. (Tianjin TIANJIN RIBAO 11 Dec 79 p 1)

Ren Yingqiu [0117 2019 4428]

Professor at Beijing College of Traditional Chinese Medicine; also Vice president of China Medical Society. (Beijing GUANGMING RIBAO 23 Dec 79 p 2)

Sun Huairen [1327 2037 0088]

Vice president of Shanghai Academy of Social Sciences and concurrently director of its Institute of Economics; on 7 Nov 79 he presided over a discussion meeting on economics with the editorial board of the journal HUASHU YUEKAN and Shanghai Municipal Economics Society. (Shanghai JIEFANG RIBAO 18 Nov 79 p 1)

Wang You [3076 3731]

Vice president of Shanghai Branch, Chinese Academy of Sciences; also director of its Institute of Organic Chemistry. (Shanghai WEN HUI BAO 14 Nov 79 p 1)

Xu Dixin [6079 3321 2540]

Vice president of Chinese Academy of Social Sciences; on 29 Nov 79 he was elected an honorary president of the newly founded China Insurance Society. (Hong Kong ZHONGGUO XINWEN 30 Nov 79 p 6)

Xu Huamin [5171 5478 3046]

Vice chairman of Shanghai Municipal Scientific and Technological Committee. (Shanghai WEN HUI BAO 3 Oct 79 p 1)

Xu Liancang [1776 5114 0221]

Deputy director, Institute of Psychology, Chinese Academy of Sciences; on 30 Nov 79 he attended a municipal-wide symposium on psychology in Tianjin. (Tianjin TIANJIN RIBAO 3 Dec 79 p 1)

CSO: 4008

AUTHOR: SHEN Yuan [3088 0337]

ORG: None

TITLE: "A Good Approach to Introduce Aeronautical Science to the General Public"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 2-3

ABSTRACT: As a delegate of the Chinese Science Foundation invited to tour the United States in May, the author visited the Aerospace Museum of the Smithsonian Institute in Washington, D.C. and the Cosmic Science Exhibit in Tokyo. The contents of both exhibits are divided into three sections: 1) a section devoted to the introduction of basic scientific knowledge; 2) a section devoted to the display of actual space vehicles and equipment; and 3) a section where the history of flight and space exploration are illustrated by three-dimensional movies. The author firmly believes that museums and exhibits of this kind are excellent means for introducing aeronautical science to the general public.

AUTHOR: NING Huie [3942 6540 6759]

ORG: None

TITLE: " A Tour of the Aerospace Museum"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 2-3

ABSTRACT: In this article, the author gives his impression of the Aerospace Museum in Washington, D.C. which he visited on May 13 of this year. During the visit, he was particularly impressed by the three-dimensional form of displays, the actual equipment and instruments used by the astronauts, and the three-dimensional movie with quadraphonic sound called "The Living Planets". In conclusion, he suggested that construction of high-standard science museums plays an important role in providing scientific eduation to the general public and deserves serious consideration by the Chinese scientific community.

AUTHRO: CHENG Bushi [4453 0008 2514]

ORG: None

TITLE: "An Impression of Aeronautical Activities in the United States"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 4-6

ABSTRACT: During his tour of the United States in the Spring of this year, the author was impressed by the large number of government sponsored and commercially available activities designed to educate the general public in the field of aeronautics. He was particularly impressed by the Aerospace Museum in Washington, D.C.; the Houston Space Center, where the public can witness the actual training activities of astronauts and the operation of a simulated control room; and the facilities at public amusement parks where visitors can personally experience aeronautical activities such as parachute jumping and roller coaster rides.

AUTHOR: GUO Yungzhao [6753 3057 6856]

ORG: None

TITLE: "The Placement of Key Components of a Tactical Missile"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 7-9

ABSTRACT: This article discusses the arrangement of key components of a tactical missile. Typically, the front section of the missile contains the fusing device, the warhead, the control system and control surfaces; the mid section contains the wings, the fuel storage tank, and the auto-pilot system; the tail section generally contains the engine, the control system and its power source. The placement of the combustion chamber and the exhaust pipe of a solid propellant rocket engine, and the placement of the inlet duct of a turbo-jet or ram-jet engine are also discussed. In conclusion, aerodynamic considerations in arranging the control surfaces are briefly explained.

AUTHOR: None

ORG: None

TITLE: "Letter to the Editor"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 p 9

ABSTRACT: In a letter to the editor, a group of physics students from the Wu-han University proposed the establishment of an UFO (unidentified flying object) research organization in China to coordinate all the UFO sitings and to explore various ideas and theories on UFO phenomena. In response to this letter, the editor of AERONAUTICAL KNOWLEDGE agreed to continue publishing aricles and news items on UFO, and offered to serve as a communication media for UFO enthusiasts.

AUTHOR: SHI Qiushi [0670 3061 1395]

ORG: None

TITLE: "The First Airplane of New China"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 10-11

ABSTRACT: The first airplane in China was built by the Jiangsi Hong-du Airplane Factory on August 1, 1954. It was the YAK-18 trainer airplane which had a maximum cruising speed of 248 km/hr, a maximum range of 1000 km, and a ceiling of 4 km. This airplane was highly stable and required a take-off distance of only 205 m. During the Kuo-ming-tang era, the Hong-du Airplane Factory was only an airplane repair shop and parts factory; it evolved into a manufacturing facility after liberation.

AUTHOR: LIN Fugen [3249 4395 2704]

ORG: None

TITLE: "The United States Rocket Airplanes"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 p 11

ABSTRACT: Rocket airplanes are winged flying vehicles propelled by rocket engines. They are designed to perform flight experiments at very high speeds and high altitudes. The first rocket airplane was the X-1, which was built by the Bell Co. of the United States; it made its first flight on December 9, 1946. Currently, the most commonly used rocket airplane is the X-24B, which has a speed of Mach 1.7. Other models of rocket airplanes built in the United States include: the X-2, the D-558, the X-15, the M-2, and the HL-10. The speed and altitude characteristics of these rocket airplanes are tabulated in this article.

AUTHOR: ZHU Yilin [2612 3015 7792]

ORG: None

TITLE: "New Developments in Space Stations"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 12-14

ABSTRACT: In September 1977, a Soviet space station called the "Soyuz-6" was launched into an orbit 350 km above the earth surface. The Soyuz-6 only has 100 cubic meters of living space but it is fully equipped with scientific instruments, communication equipment, medical equipment, as well as other life-supporting facilities for the astronauts. The station is powered by three solar panels which generate 4 kilo watts of electricity. The supplies for the astronauts are shipped to the space station by unmanned "cargo space ships". At the present time, the primary missions of the space station are: 1) examining the biological response of human bodies in space; 2) making undistorted observations of celestial objects; 3) exploring metallurgical processes to develop new materials; and 4) conducting biological experiments.

AUTHORS: WU Yangdung [0702 0111 2639]
NIU Yuhua [3662 3768 5478]

ORG: None

TITLE: "Airborne Targets"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 14-15

ABSTRACT: Airborne targets are used to train fighter pilots in practicing target shooting during air combat. Generally, airborne targets can be divided into the following types: tubular target, flag shaped target, three-blade target, pilotless drone, shuttle shaped target, and electromagnetic target. In the past airborne targets were deployed by attaching it to an airplane and towing it into the air. Modern airborne targets are deployed by pre-packaging it and releasing it from an airplane over the designated target region.

AUTHOR: YUAN Youqing [5913 1635 0615]

ORG: None

TITLE: "Space Robots"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 16-18

ABSTRACT: The "space robots" introduced in this article are essentially electronically operated automatic machines designed to perform various human functions in space. They have electronic sensors for collecting information from the surroundings, and elecronic computers which can analyze the information, make decisions, and perform the required activities under human command. The functions which space robots can perform include exploration of the moon, Mars, and other planets; assembly of factories, power stations, and communication antennas in space; and collecting data on soil conditions, crop growth, weather conditions, geological and oceanic information.

AUTHOR: ZHONG Qiang [6945 1730]

ORG: None

TITLE: "Research Airplanes"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 19-21

ABSTRACT: There are two basic types of research airplanes: 1) the experimental airplane, which is designed to explore new technologies in aeronautical science; 2) the verification airplane, which is designed to test the validity of theoretical calculations or to verify wind tunnel test results. In this article, several research airplanes are introduced: the X-1, which was built to test the feasibility of crossing the "sound barrier" to achieve supersonic flight; the X-15, which was built to test the feasibility of crossing the "thermal barrier" to achieve hypersonic flight; the X-5, which was built to test the concept of variable-sweep wing designs; a remotely controlled research airplane designed to test improved mobility in the F-15 or F-16 airplane; and a modified YF-16 verification airplane which was built to test the new airplane design concept centered around the control system.

AUTHOR: JIANG Feng [1203 3536]

ORG: None

TITLE: "The Curse of Deformation"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 22-24

ABSTRACT: In a dialogue format, this article discusses the possible causes for engine stall of a supersonic fighter airplane. Specifically, the following phenomena are explained: 1) engine stall when the fuel air mixture is too rich; 2) engine stall when the fuel air mixture is too lean; 3) the operating characteristics of compressors; 4) the phenomena of reverse flow and restricted flow which cause low speed vibration. (to be continued)

AUTHORS: CHENG De [2110 1795]
JING Gui [2529 6311]

ORG: None

TITLE: "The Rattle Snake Missile"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 25-26

ABSTRACT: The "Rattle Snake" missile was developed by the U.S. Naval Weapon Research Center in the 1950's. It is propelled by a solid fuel rocket engine and uses infrared guidance technique to home in on the engine exhaust of enemy targets. The "rattle Snake" missile is most effective against high altitude targets but has limited capability against low flying airplanes. The missile is named "Rattle Snake" because the snake also uses a heat sensor to detect the presence of its victims.

AUTHOR: REN Sucong [0117 1835 5115]

ORG: None

TITLE: "Inertial Navigation System"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 26-28

ABSTRACT: An inertial navigation system determines the position of an airplane by measuring its acceleration, and calculating its velocity and position using integrators. The major components of an inertial navigation system consist of the inertial measuring devices, the computer, and control display units. In this article, the relationship between acceleration, velocity, and position is explained. The basic principle of an accelerometer which uses the inertial motion of a pendulum to detect acceleration is also discussed. (to be continued)

AUTHORS: SANG Xiayun [2718 7209 0061]
PU Maijun [3184 6701 0193]

ORG: None

TITLE: "Destruction of Missiles by Laser Weapons"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 28-29

ABSTRACT: Last year, the United States made significant progress toward developing a high-energy laser weapon when an anti-tank missile was successfully destroyed by laser during a test. The major U.S. research and development effort in high energy laser is concentrated in an Air Force program where extensive tests are being conducted on an airborne weapon system consisting of a high power CO_2 laser and a laser aiming and tracking system. The U.S. Army is also conducting experiments on the effects of laser propagation and destructive power using a chemical laser on its White Sands Missile Test Range. Because of the atmospheric attenuation effects on laser propagation, the U.S. Department of Defense is primarily exploring the use of laser weapon in space or on high altitude airplanes.

AUTHOR: SUN Qingrui [1327 1987 3843]

ORG: None

TITLE: "Chute-Treading Parachute Jumping"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 34-35

ABSTRACT: During the 1978 national parachute jumping competition held in An-yang City, Hunan Province, a new event called "chute-treading" was introduced. This event involves two or more athletes descending on parachute-wings while treading on one another. In this article, the basic techniques and important tips of two different types of chute-treading are described: the stacked chute-treading technique, and the linked chute-treading technique.

AUTHORS: LIU Mouji [0491 6180 0165]
QIU Chenghao [6726 2052 8513]

ORG: None

TITLE: "Exploration of the Atmosphere"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 36-38

ABSTRACT: This article presents a tutorial discussion of the structure and characteristics of the atmosphere. Specifically, the stratification of the atmosphere into the troposhere, the stratosphere, the mesosphere, the ionosphere, and the exosphere is introduced. The variations in temperature, pressure, and density with altitude within the troposhere are described. In addition, the definition of the International Standard Atmosphere which specifies average values of temperature, pressure, density and speed of sound as a function of altitude is also introduced.

AUTHOR: ZHONG Qiang [0022 1730]

ORG: None

TITLE: "The Soviet Fighter Airplanes"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 38-39

ABSTRACT: In a question and answer format, this article introduces several major fighter airplanes used in the Soviet Air Force. These airplanes include: 1) the MIG-21, which is a single seat supersonic fighter airplane developed in the 1950's; 2) the MIG-25, which is a high altitude, high speed interceptor airplane; 3) the SU-15, which is a triangular-wing all weather supersonic interceptor; 4) the SU-19, which is a twin-seat fighter airplane with variable sweep wings; 5) the SU-20, which is a fighter bomber developed from the SU-7; and 6) the MIG-24 armed helicopter.

AUTHOR: ZHONG Linde [6945 7207 1795]

ORG: None

TITLE: "Side Effects of Propellers"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 pp 40-41

ABSTRACT: The propellers of an aircraft engine produce several side effects which may disturb the stability and control of the airplane. In this article, the aerodynamic and mechanical principles of the side effects are explained and measures to overcome these side effects are suggested. Specifically, the side effects discussed are: 1) the reaction torque generated by the propeller rotation which tends to tilt the airplane; 2) the slipstream which causes difference in lift on the two wings, thereby generating a rolling moment; and 3) the propeller precessional motion which accompanies a pitching or yawing motion.

AUTHOR: JING Qing [0079 5464]

ORG: None

TITLE: "The Fall of Sky Lab"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 p 46

ABSTRCAT: The United States Sky Lab was placed into orbit on May 14, 1973. The primary missions of the Sky Lab were to observe the biological reactions of human beings under prolonged weightless conditions, to make extra-terrestial observations about the sun, the earth, and to conduct metallurgical experiments in space. Although the Sky Lab was designed to orbit for ten years at an average altitude of 430 km, unexpected atmospheric drag caused it to fall toward the earth prematurely. After several unsuccessful attempts to salvage the Sky Lab, the United States government decided this year to let it fall back to earth. Fortunately, the Sky Lab landed in an uninhabited region of Australia on July 12, with no damage to human lives or properties.

AUTHOR: None

ORG: None

TITLE: "Letter to the Editor"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 p 48

ABSTRACT: In response to a reader's inquiry, the editor explains in this article certain technical terms used in Air Force missions: low altitude flight (below 1 km), mid altitude flight (1 km to 7 km), high altitude flight (above 7 km), multi-layer flight, number of waves, and number of sorties.

AUTHOR: None

ORG: None

TITLE: "Pictorial Illustrations"

SOURCE: Beijing HANGKONG ZHISHI [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 79 front cover, inside front cover, inside back cover, back cover

ABSTRCAT: The front cover of this issue shows selected scenes of the Smithsonian Aerospace Museum in Washington, D.C. The inside front cover shows a sequence of cartoons illustrating the operating principles of the Sterling engine which is a pollution-free external combustion engine. The inside back cover shows artists' conception of the space laboratory developed by the European Space Agency. The back cover is a chart showing different layers of the atmosphere and the variations in temperature and pressure as a function of altitude.

3012
CSO: 4009

Architecture

AUTHOR: None

ORG: Airport Designing Group, Fourth Office, Beijing Municipal Academy of Architectural Design

TITLE: "Designing of the New Terminal Complex of the Capital International Airport in Beijing"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 1-11

TEXT OF ENGLISH ABSTRACT: The new terminal complex lies to the northwest of the existing one which is no longer big enough to meet the demands of today's developments. The design of the complex was derived from a master plan which will be accomplished in phases. The construction of the complex of this phase is on the west of the site; the east areas are left for future expansions.
The complex can accommodate 1,500 passengers per peak hour and has 20 aircraft park (8 round either of the east and west satellites; 16 aircrafts to be accessible by boarding bridges, 4 by limousines.) It has a total floor area of 58,346 sq.m. and is 193.20 m in length from east to west.
The complex has two satellites which are at 250 m center to center. The main building consists of three floors above ground and one basement. Incoming passengers are taken to the ground floor, where there are lounges, baggage

[continuation of JIANZHU XUEBAO No 5, 1979 pp 1-11]

claim area and reception rooms. The west wing of this level is for VIP; the east wing is for liners' crew and foreign aviation companies. On the first floor are spaces for outbound passengers, including a spacious hall for ticketing and baggage check as well as lounges. Delegation rooms and ships are arranged on the west wing of this level; on the east wing are liners' registration hall and airline operation center.
Bars and observation terrace are on the top level. There are two restaurants on the west wing; transit passengers and liners' crew dine on the east wing. Service facilities such as post office, bank, telex, telephone, tea, toilets, and information are provided both on the ground and first floors.
Modern facilities have been employed in the design, such as passengers' boarding bridge, mechanical baggage handling system, automatic passenger movers, computer controlled flights time table, etc. All facilities not only meet the functional requirements but also ensure speed, safety, and convenience for passengers and baggage handling.
In architectural treatment, efforts were made to care for the organic combination of modern terminal structure with Chinese traditional features so as to create a new style with a sense of plainness, terseness, and clarity.

AUTHOR: LUO Shenghua [5012 0524 5478]
DING Gongpei [002 0361 1173]
TAN Linhai [6223 2651 3189]
HAN Sen [7281 2773]

ORG: All of Jiangsu Provincial Academy of Architectural Design

TITLE: "The Monument in Memory of the Victorious Crossing of the Yangzi River"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 12-15

TEXT OF ENGLISH ABSTRACT: A new monument was unveiled recently in Nanjing, Jiangsu Province, in commemoration of the 30th anniversary of the victorious crossing of the Yangzi River on 21 April 1949 by the Chinese People's Liberation Army. The liberation of the city of Nanjing proclaimed the end of the misrule of the Kuomintang.

The 23.4-meter-high monument is in the shape of a sailing boat. The shaft of the monument is composed of two white 18-meter-high curved reinforced concrete slabs with 0.70 m at the top and 1.50 m at the bottom apart. A golden disk 2.5 m in diameter is placed on the upper part of the shaft which is a copy of the souvenir in memory of the victorious crossing. South of the monument stands a granite stele with the engraved gold letters "Monument in Memory of the Victorious Crossing of the Changjiang [Yangzi] River" in the handwriting of Vice-Premier Deng Xiaoping, who was one of the commanders of this famous campaign.

[continuation of JIANZHU XUEBAO No 5, 1979 pp 12-15]

On another granite stele to the north of the monument is engraved in fine gold letters Chairman MAO's poem"the People's Liberation Army Capture Nanjing" in his handwriting.

The monument is erected on a platform 24 m square paved with granite slabs, and greenery is laid out on the west and east sides of the platform. The scale treatment of the monument fits in well with the square on which it stands and the height of the surrounding buildings. Unlike most monuments designed in orthodox architectural form the designers of this monument have successfully created a work of novelty and individuality.

AUTHOR: ZHANG Jinggan [1728 2417 3227]
REN Chaojun [0117 2600 6874]
XIAO Jiyuan [5618 3444 0337]

ORG: None

TITLE: "Planning and Construction of the Front-Three-Gates Housing Project"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 16-22, 11

TEXT OF ENGLISH ABSTRACT: This newly built housing project is located on the south side of the Front-three-gates Street in Beijing, which runs along the ancient city wall that had been pulled down, beginning from the Chongwen Gate on the east, passing through the Front Gate and the Xuanwu Gate and ending at the West Second Ring Road on the west. The first phase of the project covers a site of 22 hectares stretching for five kilometers along the street and occupies a total floor space of 600,000 square meters. Among them are multistory apartment houses totalling 400,000 square meters, which can accommodate nearly 7,000 households. The rest is devoted to public welfare facilities needed by the occupants.

Most of the apartment houses are nine to thirteen story slab blocks, with some eleven to fifteen story point blocks inserted between them. These blocks consist mostly of two-room flats, with an average floor space of 52 square meters. Large dimension formwork building system is used for all the blocks, i.e. cast-in-situ reinforced concrete internal walls 16 cm thick, prefabricated external

[continuation of JIANZHU XUEBAO No 5, 1979 pp 16-22, 11]

wall panels and prestressed hollow R.C. floor slabs.

Public welfare facilities are provided in three grades, namely, dwelling group, neighbourhood unit and living quarter. The dwelling group is composed of 500-700 households; the welfare facilities such as clinic, service station, canteen, after-school activities station, etc. are generally housed at ground level or sub-basement in the apartment house. The neighborhood unit, containing 800-1200 households, has kindergartens, middle and primary schools, food and non-staple food stores, etc. with a service radius of about 250 meters. The living quarter has a population of 1,600-3,600 and welfare facilities such as department store, market, restaurant, bank and so on are provided, with a service radius of some 600 meters.

AUTHOR: MENG Jun [1322 6874]
SUN Mingyuan [1327 2494 6678]

ORG: None

TITLE: "Monument to Martyrs of the Huaihai Campaign"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 23-25

ABSTRACT: The monument is located at the foot of the beautiful Fenghuang (Phoenix) Mountain in the southern suburbs of the city of Xuzhou, where the Chinese People's Liberation Army fatally destroyed the Kuomintang reactionary military force in the Huaihai Campaign in 1948-49.
The monument is spatially linked with a memorial hall by roads and a circular square, 160 m in diameter. On the front elevation of its shaft are engraved gold letters, "The Monument to Martyrs of the Huaihai Campaign" in the late Chairman MAO's handwriting. The base of the monument consists of a platform and granite steps, and an inscription in memory of the martyrs is carved on a stele on the front side of the base. Flanking the base are two large-sized reliefs nearly 100 sq. m each depicting the heroic deeds of the martyrs. The shaft of the monument, 38.15 m high is constructed of reinforced concrete and faced with granite. The memorial hall employed the Chinese traditional style with yellow glazed tile roofs.

AUTHOR: TENG Dian [3326 0368]

ORG: None

TITLE: "Design of a Highly Sound-Absorbing Recording Studio"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 263f, 53

ABSTRACT: The original recording studio of Shanghai Motion Picture Plant had very poor accoustic properties. The responsibility of the plant is to translate and dub Chinese voices to foreign motion pictures and foreign voices to Chinese motion pictures; accoustic requirements are therefore very high. The author and colleagues first compared five available sites to choose one of relatively quiet surroundings. The new recording studio and the technical building measure about 1,500 m^2, while the original studio was converted into offices. The finished product is an L-shaped building with an external corridor to prevent noise transmission. The design requirements, the technical measures, the accoustic properties, and the recording effects of the new studio are described.

AUTHOR: None

ORG: Northeast Academy of Architectural Design

TITLE: "Three New Railway Stations in Southern Liaoning Province"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 31-34

TEXT OF ENGLISH ABSTRACT: The railway stations of Liaoyang, Haicheng, and Dashiqiao were heavily damaged by a strong earthquake in 1975. After the accident, three new stations have been set up on the original sites. The total floor area of the Liaoyang Station covers nearly 7,000 m^2 and that of the other two about 5,000 m^2 respectively. The design of the stations aims at creating a unified new architectural style, and strives to organically integrate form with function and structure, and make the external facades honestly express the internal spaces. The flexible plan arrangement leads to the creating of flowing spaces both horizontally and vertically. The structure is of reinforced concrete frame with precast wall panels.

AUTHOR: TANG Yongwei [0781 3057 0251]

ORG: Suzhou Municipal Bureau of Garden and Forest Management; Suzhou Municipal Office of Architectural Design

TITLE: "Design of a Teahouse in Suzhou"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 35-37

TEXT OF ENGLISH ABSTRACT: Dongyuan (East Garden) a new park now under construction in Suzhou (Soochow) is located at the northeast corner of this famous scenic city. Its east part comprises a stretch of ancient city wall about one kilometer long from north to south, which has been transformed into a wide green belt with intriguing wavy hillocks. On the south of its west part is an existing traditional garden called Ouyuan and on the orth a zoological garden. Its central part contains a peach orchard and a large open space, which is to be laid out as a place for public activities. Though the park covers only about 20 hectares, it will provide additional amenities to people living near the civic center.

The teahouse is situated at the northeast corner of the peach orchard, with its north and east facades overlooking a lake. The building group consists mainly of tea rooms, a buffet, a reception room, a pavillion, and ancillary rooms, with a total floor area of 850 m^2. To make full use of the different levels of the site, the several parts of the group are designed in small masses connected with covered corridors and lattice walls, thus creating an interpenetrating spatial composition.

AUTHOR: None

ORG: Guangxi Zhuang Nationality Autonomous Region Construction Committee Academy of Comprehensive Designing

TITLE: "The Guangxi Nationality Museum"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 36-39

ABSTRACT: The Guangxi Nationality Museum is for displaying documents and artifacts of the history, the revolution, and the period known as Taiping Tianguo in Guangxi. It was completed in December 1978 in Nanning, covering an area of 12,269 m^2. Due to the fact that the building site is low and damp, the structure is superimposed on shafts which create an empty space, 5 m in height, below the building. The extra depth (42.5 m) and the south-north direction of the building provide the needed ventilation to accommodate the southern climate of the city, and two shaded courtyards are placed in the middle of each wing of the building to given additional open spaces. Murals depicting betel-nut trees and kapok trees grace the walls of the staircases to add a local atmosphere.

AUTHOR: None

ORG: Sichuan Building and Exploring Design Institute

TITLE: "The Central Teaching Quarter of the Southwestern Communication University"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 40-42

ABSTRACT: The Southwestern Communication University (the former Tangshan Railway College) is located at the foothills of Emei Mountains of Sichuan Province. On the basis of the terrain, the school is divided in five sections. The department of Electrical Engineering is in the east; the Laboratories of Departments of Mechanical Engineering and Railways are in the west; the dormitories are in the north. The teaching quarter is located in the center, occupying about 300,000 m^2 of floor space. Construction of the central teaching quarter began in 1974 and has now been largely completed. Four bridges in the rear of the main building link the four upper stories of the building with the four terraces of the site to eliminate the need for elevators. There is an athletic field to the east of the building group, with a circular tract measuring 400 m.

AUTHOR: FANG Guanqun [2455 0385 5028]

ORG: None

TITLE: "Hefei Scientific and Technological Activities Building"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 42-43

ABSTRACT: The Scientific and Technological Activities Building in Hefei [Anhui Province] is designed and built for the popularization and exchange of sciences and technologies. A site was chosen in the northern end of Baohe Park, on the basis of not demolishing people's residences. The building has 6,224 m^2 of floor space, providing product exhibition room, a museum of science and technology, a reading room of foreign and domestic publications, an information storage room, a copying and printing room, and an auditorium. In order that the auditorium has no pillars to obstruct the view of the audience, it is placed on the second floor. Including the motion-picture screen and the podium, the auditorium measures 14.7 x 27 m. With consideration of the accoustic requirement, the ratio of the length, width, and height is designed to be 4:2.5:1, with a total volume of 2,300 m^3, having an average of 4.16 m^3/person.

AUTHOR: LIN Zhangsheng [2651 3361 3932]

ORG: None

TITLE: "An One Meter Telescope Observation Station"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 44-45

ABSTRACT: Yunnan Observatory is located in Fenghuang Mountain of the eastern suburb of Kunming, Yunnan Province. The area is 2,000 m in elevation and has conditions favorable for observing the stars and space of the Southern Hemisphere. A new one meter telescope observation station has been recently added. The main lens of the instrument has a diameter of 1,016 mm of RCC (Ritchey-Chrelien Coude) optical system. Aside from the observation room, a constant temperature photographic room is also needed to maintain the focal ratio and the stability of chromatic dispersion. In order to guarantee precision, the environmental condition of the observation room must also be studied. For example, the wind factor, the asymmetrical thermal radiation, and the ground surface atmospheric refraction differential will all affect the spectral clarity of the stars. With experimentation, the observation room is raised to more than 25 m from the ground surface to minimize these effects. These and other details of the designing process are discussed.

AUTHOR: YANG Hongxun [2799 7703 8113]

ORG: None

TITLE: "An Architectural Drawing of the Early Third Century B. C."

SOURCE: Beijing JIANZHU XUBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 46-47

TEXT OF ENGLISH ABSTRACT: The capital of the state of Zhongshan, founded by a nomadic people of the north in the Warring States Period (475-221 B.C.) was situated in present day Pingshan County, which is just to the northwest of the city of Shijiazhuang in western Hebei Province. In the course of excavation, done between 1974 and 1977, a number of cultural objects were found in the royal cemetery and its auxiliary tombs. Among them is a copper plate inlaid with gold and silver and etched with a plan of the palace and a 450-character inscription. This is the earliest architectural design drawing of palace buildings discovered so far in China.
The plate measures 480 by 940 mm and has a thickness of 10 mm. On the plate, there are characters indicating the name of rooms and length of distances. Through scientific study, it was found that the plan was drawn on the scale of 500th, and the two tombs now designated as No 1 and No 2 were built according to the plan drawn on the plate. All this reflected the level of building technology which has been reached in the Warring States Period.

AUTHOR: None

ORG: None

TITLE: "Architectural Records"

SOURCE: Beijing JIANZHU XUEBAO [ARCHITECTURAL JOURNAL] in Chinese No 5, Sep 79 pp 48-63

ABSTRACT: In this "Architectural Records" department, short reports on the following subjects are presented: (1) Liaoyang Petrochemical Fiber General Plant; (2) Tangshan, Being Earnestly Rebuilt; (3) Hebei Provincial Hospital; (4) Classroom Building of Dongguan Elementary School of Hu County; (5) Design of Jinyu Park [Goldfish Park] in Hangzhou; (6) International Seamen's Merchandise Mart in Qinhuangdao; (7) Guizhou Provincial Institute of Prevention and Treatment of Occupational Diseases in Metallurgy; (8) Visitor's Center of the Fifth Metallurgical Construction Company in Chengdu; (9) Visitor's Center of Hubei Chemical Fertilizer Plant; (10) Designing of Natural Lighting and Ventilation of Two Heavy Machinery Plants; (11) Yinchuan Youth Scientific and Technological Activities Station; (12) Details of Commercial Architectural Designs. Numerous photos and drawings accompany the descriptions of the above structures.

6168
CSO: 4009

AUTHOR: Wang Shizhong [3769 0013 0022]
Jiang Guirong [3076 2710 2837]

ORG: Department of Molecular Biology, Institute of Basic Medicine, Chinese Academy of Medical Sciences, Beijing

TITLE: "Electrophoretic Separation of Salivary Proteins in Polyacrylamide Gel and Characterization of their Main Fractions"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp299-308

TEXT OF ENGLISH ABSTRACT: (1) Whole saliva, concentrated ten fold, was subject to polyacrylamide gel electrophoresis.

(2) At least 13 protein bands were found. Among them five were strongly, others moderately dyed. Still others showed only faint color.

(3) To facilitate characterization, the 13 bands were arbitrarily divided, starting from the cathode side to the anode side, into five zones, i.e., zones A, B, C, D and E.

[continuation of SHENGHUAXUE YU SHENGWUWULE XUEBAO No 1, Dec 78 pp 299-308]

(4) 11S IgA was found in zone A. IgG, however, cannot be detected.

(5) Amylase is the main protein of saliva. Its activity is very high. By means of "Phadebas" amylase test tablet, amylase was found to be located mainly in zone B.

(6) Most of the lysozyme activity was present in zone C, though a smaller activity was also detected in zone A.

AUTHOR: Zhang Xianyang [1728 0341 2254]
Qi Zhengwu [2058 2873 2976]
Luo Chaoquan [5012 6389 2938]

ORG: Zhang and Qi--Shanghai Institute of Biochemistry, Chinese Academy of Sciences; Luo--Biochemical Laboratory of Sun Yatsen Medical College, Canton

TITLE: "Studies on Polyfunctional Crystalline Proteinase Inhibitors from Arrowhead (Sagitteria sagittrifalia, Linn)"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp309-320

TEXT OF ENGLISH ABSTRACT: Two polyfunctional crystalline proteinase inhibitors A and B were obtained from Sagittaria Sagittrifalia L., each with two identical active centers. The relatively high activity and polyfunctionality of this inhibitor are quite unusual among similar plant proteinase inhibitors.

Both A and B could inhibit trypsin as well as chymotrypsin and kallikrein from swine subaxillary gland. The weight ratio of A or B to trypsin inhibited was determined using the following trypsin substrates: casein, benzoyl arginine ethyl ester and

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp309-320]

benzoyl agrinine α-naphthyl amide. With different substrates the ratios obtained were rather close, the mean values being 2.70 and 2.86 for inhibitors A and B respectively. The dissociation constants were found to be in the range of 10^{-9} to 10^{-10}. The weight ratios of A and B to chymotrypsin required for inhibition to the extent of 50% were also determined using casein, benzoyl tryosine ethyl ester or nicotinyl tyrosine hydrazine as substrate. B showed a stronger affinity for trypsin than A, while A was apparently a more efficient inhibitor for chymotrypsin and kallikrein than B.

The molecular weights of inhibitors A and B were determined by means of gel filtration on Sephadex and electrophoresis on polyacrylamide gel and both were found to be about 17,000. From the activities of inhibitors A and B towards trypsin, assuming one to one combination, it was estimated that the effective molecular weights of both A and B were about 8500, so it was inferred that, like the mung bean trypsin inhibitors, A and B also contain two active centers with the same biological function.

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp309-320]

The amino acid compositions of inhibitors A and B were similar except for slight differences in the content of basic amino acids. Both of them were found to contain two disulphide bonds and to be rich in non-polar acids (>60%). The minimum molecular weights estimated from the amino acid compositions were about 16,500.

For both inhibitors A and B the N-terminal amino acid was aspartic acid, as determined by the FDNB and DNS-Cl methods and further confirmed by enzymic hydrolysis with aminopeptidase M.

AUTHOR: Chen Lin [7115 7207]
Gu Fanji [7357 0416 0644]

ORG: University of Science and Technology of China, Hefei

TITLE: "A Study on the Function of the Lateral Inhibition Network of the Limulus Compound Eye"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp321-332

TEXT OF ENGLISH ABSTRACT: The lateral inhibitory network was studied as a spatial digital filter. When the distribution function of tne inhibitory coefficient is Gaussian, the network is not only a filter which suppresses the lower spatial frequency components and thus enhances the contrast, or a higher frequency pass filter, but is is also an inverse Gaussian filter which can recover the image blurred by the random disturbance in the medium, thus enhancing contrast and raising the 'signal-noise ratio'.

The difference between the recurrent and nonrecurrent network has also been studied. When the distribution function of the lateral inhibition coefficient is Gaussian, the nonrecurrent inhibition network can not be an inverse Gaussian filter. In general, to

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp321-332]

possess the same given transfer function, fewer lateral branch interconnections and a simpler distribution of the lateral inhibition coefficient are needed for a recurrent network than for a nonrecurrent one, so that the recurrent inhibitory network can be constructed or regulated more easily.

AUTHOR: Qin Wenbin [4440 2429 2430]
Li Chenglin [2621 2052 2651]
Cui Lixia [1508 7787 7209]
Chen Qiming [7115 0366 2494]
Yue Xiulan [1471 4423 5695]
Liu Sumei [0491 4790 2734]
Wang Zhipeng [3769 1807 7720]
Chen Shuqin [7115 3219 3830]
Zheng Baozhi [6774 1405 5347]
Yuan Guocheng [5913 0948 1004]
Chen Yazhen [7115 7161 3791]

ORG: Qin, Li, Cui, Chen Qiming, Yue and Liu--Baotou Medical College, Baotou; Wang, Chen Suqin, Zheng, Yuan and Chen Yazhen--Hospital of Baotou Iron and Steel Company, Baotou

TITLE: "A Fast-moving Hemoglobin Discovered in Han Men (Chinese) at Baotou--Hb Baotou"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp333-340

TEXT OF ENGLISH ABSTRACT: 1. A fast-moving abnormal hemoglobin was discovered in about 1,000 Han men (Chinese) at Baotou.

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp333-340]

2. Family studies showed that the hemoglobin was a variant with genetic relationship.

3. It was a β-peptide chain variant which had been demonstrated by the results of molecular hybridization.

4. On electrophoresis at alkali pH, the hemoglobin runs between HbA and HbH.

5. In acid-agar gel electrophoresis, it travels toward the cathode side similarly to HbF.

6. Its ultraviolet absorption spectrum differs from that of HbF and HbA.

7. The hemoglobin was named as Hb Baotou, since it was not identical with other known hemoglobins.

AUTHOR: None

ORG: Research Group on Genetic Engineering, Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "Screening of High Yield α-amylase Producing Strains from Bacillus subtilis 168 by Transformation"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp341-347

TEXT OF ENGLISH ABSTRACT: When Bacillus subtilis 168 (trp^-, producing trace α-amylase was treated with DNA isolated from Bacillus subtilis 209 (lin^R, producing high level α-amylase) and Bacillus subtilis H-16 (str^R, producing high level α-amylase), a variety of transformants carrying one, two or more donor characters was obtained, some of the transformants gave increased α-amylase at levels 24% higher than those of the donor. A large number of transformants yielded α-amylase lower than the donor but higher than the receptor B. subtilis 168. These results show that transformation is a valuable tool for selecting new strains.

AUTHOR: None

ORG: Enzyme Structure and Function Research Group, Institute of Microbiology, Chinese Academy of Sciences, Beijing

TITLE: "Electron Microscopy of Glucoamylase Crystals from Monascus sp."

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI SUEPAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp349-354

TEXT OF ENGLISH ABSTRACT: Glucoamylase crystals of Monascus sp. were examined under the electron microscope after fixation with glutaraldehyde and negative staining with uranyl acetate. At low magnification (x30,000), the crystals were rod in shape with sharp edges. At high magnification (x162,000), the enzyme molecules could be visualized as spheres 50 Å in diameter and arranged orderly. The intermolecular spacing was about 6 Å. No subunit was observed.

Selected area electron diffraction patterns of the crystals showed four rings, with interplanar spacings d of 6.4Å, 3.2Å, 2.1Å and 1.3Å. The method of laser optical diffraction has been used to analyse the micrographs. It was proved that the crystal of glucoamylase has a true crystal ordered in three dimensions.

AUTHOR: None

ORG: The Virus Research Group, Shanghai Institute of Biochemistry, Chinese Academy of Sciences and The Virus Research Group, Department of Plant Protection, Zhejiang Institute of Agricultural Research, Hangzhou

TITLE: "The Pathogens of Some Virus Diseases of Cereals in China: IV. Serological Determination of the Percentage of Active Individuals Transmitting Rice Dwarf Disease in a Population of Insect Vectors"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp355-362

TEST OF ENGLISH ABSTRACT: A simple procedure for the isolation and purification of rice dwarf virus has been developed and employed routinely for several years in this laboratory. The essential features of the method involve chloroform treatment, polyethylene glycol (PEG) precipitation and differential centrifugation.

The antisera obtained in rabbit using purified preparations give a titre of 1:4,000~1:8,000(sometimes as high as 1:16,000).

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp355-362]

Results on the serological determination of the percentage of active individuals transmitting rice dwarf disease in a population of the offspring of the infective leafhopper Nephotettix cincticeps, Uhler, were compared with those obtained using biological assay. The agreement was of the order 86%.

AUTHOR: None

ORG: The Virus Research Group, Department of Plant Protection, Zhejiang Institute of Agricultural Research, Hangzhou and The Virus Research Group, Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "The Pathogens of Some Virus Diseases of Cereals in China: VI. The Identification of Pathogen of Rice Yellow Stunt Disease"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp363-367

TEXT OF ENGLISH ABSTRACT: In the ultrathin sections of infected leaf cells, numerous bullet shaped virus particles were observed. Many of the particles were arranged between the inner and outer membranes of the nucleus, and many were distributed in both the cytoplasm and nucleus. The particle has the following dimensions: length 150~180nm, width 70~90nm, thickness of the wall 20~25nm. From the crude extracts of the fresh infected plants, a large number of bullet shaped particles were also found. The crude extracts were clarified with diatomaceous earth, followed by centrifugation at 90,000g for 30 minutes. A partially purified virus preparation was obtained.

AUTHOR: Zou Yongshui [6760 3057 3055]
Gong Zuxun [7395 4371 1053]
Pan Jiaxiu [3382 1367 4423]

ORG: Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "The Sub-Filamentous Structure of Paramyosin Ribbons"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] In Chinese No 4, Dec 78 pp370-374

TEXT OF ENGLISH ABSTRACT: Using an enzymic procedure we have demonstrated that the paramyosin ribbon from homogenized preparations of the white adductor muscle of the fresh-water bivalve Cristaria plicata, Leech, is made up of subfilaments with a diameter of 30Å, running parallel to the long axis of the ribbon. The mode of the lateral aggregation of these sub-filaments into the paramyosin ribbon suggests that they are mainly composed of paramyosin.

It is possible to repeat at will the two-dimensional lattice pattern of partially dissolved paramyosin ribbon first observed by Hall, et al. The node pattern of the paramyosin ribbon of this

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp370-374]

fresh water bivalve has characteristic constants $\alpha \sim 40^\circ$ and $\beta \sim 50^\circ$.

Along the length of the intact paramyosin filament there are points mechanically weak or more susceptible to enzymic attack. The nature of this inhomogeneity remains to be elucidated.

AUTHOR: Zou Yongshui [6760 3057 3055]
Gong Zuxun [7895 4371 1053]

ORG: Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "Paramyosin Filaments in Amphioxus"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] In Chinese No 4, Dec 78 pp376-380

TEXT OF ENGLISH ABSTRACT: Using mechanical disintegration, we found that paramyosin filaments with perodic striations of 14~14.5 nm and 7nm were present in the preparations of muscle filaments of amphioxus (Branchiostoma belcheri, tsing-taoensis , an animal belonging to the nearest subphylum to the vertabrata. The diameter of these paramyosin filaments were shown to be grouped around 25, 55 and 100nm. The length of these filaments may be over 700nm. Treatment of a homogenate of amphioxus with bovine trypsin without stirring, revealed that paramyosin filaments are made up of subfilaments with a diameter of 2.0~2.5nm.

AUTHOR: Wu Aizhen [1566 1947 3791]
Dai Renming [2071 0088 7686]
Shen Xueren [3088 1331 0088]
Sun Yukun [1327 3768 2492]
Hu Xuefang [5107 7185 5364]
Ma Dehe [7456 1795 0735]
Qian Yuanjun [6929 0337 7486]

ORT: Wu, Dai, Shen, Sun--Shanghai Institute of Biochemistry, Chinese Academy of Sciences; Hu, Ma and Qian--Institute of Sericulture, Chinese Academy of Agriculture, Zhengjiang

TITLE: "Studies on Double-Stranded RNA Viruses: I. A simple Method for the Purification of the Cytoplasmic Polyhedrosis Virus of the Silkworm"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp381-389

TEXT OF ENGLISH ABSTRACT: The cytoplasmic polyhedrosis virus of the silkworm is the prototype of a large group of animal, plant, fungal and bacterial viruses that contain segmented double-stranded RNA. Studies of the mechanism of replication of the

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp381-389]

double-stranded RNA viruses are of great significance both in theory and in practice. A very simple method for the purification of cytoplasmic polyhedrosis virus of the silkworm by means of Sephadex G-200 gel column chromatography without resorting to ultracentrifugation is described herein. Ultraviolet absorption, polyacrylamide gel electrophoresis and electronmicroscopy clearly show that the preparation of cytoplasmic polyhedrosis virus thus obtained is homogeneous. The infectivity assay indicates that the LD_{50} for cytoplasmic polyhedrosis virus is 1.11×10^{-10} g/larva through oral inoculation into early (first day) second instar larvae.

AUTHOR: Zeng Yishen [2582 0110 3947]

ORG: Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "Purification and Characterization of DNA From Some Plants"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp391-397

TEXT OF ENGLISH ABSTRACT: A simple, rapid and reliable procedure for the purification of plant DNA is described which can be completed in several hours. The native and high-molecular-weight DNA isolated by this modified procedure is free from contamination with RNA and protein. Analysis of the DNA indicates that it meets the desired requirement for use in transformation.

AUTHOR: None

ORG: The Fish Reproductive Physiology Research Group, Amoy Fisheries College and The Peptide Hormone Group, Shanghai Institute of Biochemistry, Chinese Academy of Sciences

TITLE: "Radioimmunoassay on Serum Gonadotropin of Carp (Cyprinus carpio L.)"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp399-407

TEXT OF ENGLISH ABSTRACT: The mixed pituitary glands of Cyprinus carpio, Carassius auratus, Hypophthalmichthys molitrix and Aristichthys nobilis were extracted with ethanol. Then the crude gonadotropin was fractionated by chromatography on DEAE-cellulose and gel filtration. Biological activity as assayed by ovulation test of the loach (Misgurnus anguillicaudatus) in vivo was recognized only in the second fraction (Sephadex G-100). Effective dose of induced ovulation as 1μg/g body weight. The gonadotropin (SG-II-2) exhibited a single band on polyacrylamide gel electrophoresis. The determinable range of this gonadotropin radioimmunoassay was 0.1~16ng.

[continuation of SHENGHUAXUE YU SHENGWUWULI XUEBAO No 4, Dec 78 pp399-407]

Serum gonadotropin levels of carp (Cryprinus carpio) have been determined by means of radiommunoassay through the whole reproductive process. Particularly the female exhibited a significant and higher peak during the sexual behavior and spawning. After the spawning, the serum gonadotropin levels have a quick drop down. This investigation provided some new data for reproductive physiology of fish.

AUTHOR: None

ORG: The Virus Research Group, Xinjiang Institute of Chemistry, Chinese Academy of Sciences

TITLE: "Electron Microscopic Examination of Hami Melon Mosaic, Maize Dwarf Mozaic and Wheat Mosiac Viruses of Xinjiang"

SOURCE: Shanghai SHENGHUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp409-411

TEXT OF ENGLISH ABSTRACT: Thread-like virus particles were found in the Hami melon plants infected with a mosaic disease in Turfan, Urumchi and Shexotze districts in Xinjiang. The virus particles, with a diameter of 180 Å and length longer than 10,000 Å, sometimes form unusually complex and orderly aggregates. In the maize plants infected with maize dwarf mosaic disease in Shexotze, large amounts of thread-like particles could be isolated, with a diameter of 179 Å, and length~6,000 Å, but occasionally 20,000 Å. The diameter of the central core was~30 Å. In the diseased plants infected with wheat mosaic virus grown in Urumchi rodlike particles were found with the following dimensions: diameter 180 Å; length 6,000~13,000 Å and diameter of central core 40 Å. The above-mentioned virus particles were all isolated and partially purified with the aid of polyethylene glycol precipitation and differential centrifugation.

AUTHOR: Liu Shilian [0491 1102 1670]
Xu Chengsu [6079 2052 4790]
Cui Lianxian [1508 5570 0103]
Yang Guizhen [2799 2710 3791]
Zhang Shuzhen [1728 3219 3791]

ORG: Chinese Academy of Medical Sciences

TITLE: "Modification of the Purification Method and In Vitro Bioassay of Thymosin F_5"

SOURCE: Shanghai SHENGJUAXUE YU SHENGWUWULI XUEBAO [ACTA BIOCHEMICA ET BIOPHYSICA SINICA] in Chinese No 4, Dec 78 pp413-416

TEXT OF ENGLISH ABSTRACT: The procedure of isolation and purification of thymosin F_5 as described by A. L. Goldstein, et al. has been modified and simplified. A modified rosette in vitro bioassay using human umbilical cord blood lymphocytes was developed. A complete report including biochemical and immunochemical studies of the thymosin F_5 prepared by this modified method will be published elsewhere.

11580
CSO: 4009

AUTHOR: HONG Tai [3163 3141]

ORG: China General Overseas Transport Company

TITLE: "Developing China's Overseas Transport Industry"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 p 3

ABSTRACT: China was originally among the countries of the world which relatively early developed navigation, but in the past century, foreign aggression and reactionary rule had destroyed it. After the liberation, a Sino-Polish Shipping Company was organized in 1951 and the China General Overseas Transport Company was established in 1961 to launch an ocean transport industry of the New China. Considerable import and export cargoes still depended on ships rented from foreign countries, however. In 1964, Premier Zhou proposed the use of bank loans to accelerate the purchase of ships from foreign countries, and in 1970 he proclaimed a policy of "terminating the need for renting foreign ships by 1975." In spite of the accusation of LIN Biao and the gang of four who regarded buying ships from foreign countries as treason, by the end of 1975 the number of ocean-going vessels was increased to 10.7 times of that of 1961. In the short 3 years after the downfall of the gang of four, the tonnage was further enlarged 49 percent. At present, China's vessels are reaching 406 harbors of 100 nations of the world.

AUTHOR: YU Guomin [0151 0948 3046]

ORG: None

TITLE: "Rolling Currents of Iron Defend the Ocean Border"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 4-5

ABSTRACT: In very general terms, this paper describes the process with which a fleet of Chinese destroyers, submarines, etc. successfully defended South China Sea against the attempted incursion of battleships of Vietnam and the Soviet Union on 17 February 1979 and for a period of 20 days following that day. On the victory celebration meeting, 15 naval groups and 82 individuals were awarded medals, including one XIE Yuanxiong [6200 0337 7160] who lost an eye from an accident during the maneuver.

AUTHOR: None

ORG: The 104 Research Office, Shanghai Jiaotong University

TITLE: "Delightful Accomplishment"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 p 4

ABSTRACT: The model basin of the Ship Fluid Dynamics Laboratory of Jiaotong University was constructed in 1958. The basin measures 110m x 6 m, with a water depth of 3 m. Wave producing and wave extinguishing instruments are provided at each end of the basin. In 1978, a bubble tunnel was also constructed for experimental studies on the dynamic properties of propellers in even and non-even flow fields. Accomplishments of the laboratory are briefly described.

AUTHOR: LIN Dehui [2651 1795 6540]

ORG: None

TITLE: "Ships in the Process of Being Developed to Utilize the Energy of the Ocean"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 6-8

ABSTRACT: Theories and applications of sea water temperature differential Power Generator Ships and tide Wave Power Generation Ships are described, including the technique of using sea water temperature differential to manufacture ammonia fuel battery systems. The possibility of future conversion of ocean energy to electrical energy is predicted but there is no mention of any immediate plan for utilizing the energy of the sea in China.

AUTHOR: XI Gengyong [1153 2704 0516]

ORG: None

TITLE: "Passenger Cruisers on the Yangzi River"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 10-12

ABSTRACT: The Yangzi River has historically been an important transportation channel of China while steamship navigation on that river has been a tradition of close to a century. At present, there are more than one thousand ships of all sizes regularly navigating the main channel. This paper describes only the passenger carrying vessels, although they also transport some cargoes. Characteristically, a passenger vessel on the Yangzi generally has 4-5 levels of decks. There are photos depicting the Dongfanghong-11 and the Dongfanghong-38 which travel between Shanghai and Hankou all seasons of the year. Experimental propeller and air cushion vessels intended for passenger traffic of that river are also mentioned.

AUTHOR: LIN Yujie [2651 5940 2638]

ORG: None

TITLE: "Youdian-1, A Ship for Laying Cables at the Bottom of the Sea"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 12-13

ABSTRACT: On 4 May 1973, China signed a contract with Japan to construct an ocean floor electrical cable between the two countries. It was to be built and utilized jointly. The cable-laying ship Youdian-1, designed and built by China herself successfully completed the cable-laying responsibility for China in May 1976. The cable became operative in October of that year and has provided normal service of communication ever since. A detailed description of the cable-laying ship, Youdian-1 is given.

AUTHOR: ZANG Xinmin [5258 2450 3046]

ORG: None

TITLE: "The Birth of Aircraft Carriers"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 19-21

ABSTRACT: Aircraft carriers are the most important vessels in the modern navy. They are like movable airports on the sea, but to this day, they have had a history of no more than 60-70 years. This paper relates the story of the 26m wooden runway on the deck of the USS Birmingham inHamptom Roads on a day in 1910 and the subsequent development of aircraft carriers. Early aircraft carriers of England and Japan are also briefly mentioned.

AUTHOR: YAO Jiajin [1202 1367 3866]

ORG: None

TITLE: "Current Developmental Condition of Air Cushion Vessels"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 p p 20-21

ABSTRACT: Since 1974, air cushion vessels have been improved sufficiently to be very reliable. They are now being extensively applied. Four air cushion vessels now sail the English Channel, and in 1975 alone, they carried 1,700,000 passengers and 270,000 automobiles across the channel. There are about thirty commercial air cushion vessel companies in the world. England supplies 85-90 percent of all air cushion vessels used in the world. Today, there are about 3,000 of them. The conditions of their development in the United States and the Soviet Union, for military and for commercial applications are briefly described. The"author" claims to have translated the paper, but its original source is not mentioned.

AUTHOR: CHU Jiakang [0328 0857 1660]

ORG: None

TITLE: "Past, Present, and Future Submarine Engines"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 22-25

ABSTRACT: This paper traces the history of development of submarine engines beginning with manually cranked propeller engines from 1776 to 1801 of inventors of the United States, through the steam, battery, and internal combustion engines of the 19th century,to the nuclear powered submarine. Although the nuclear powered engine has made it possible for the vessel to be submerged for a prolonged period of time, it has the disadvantage of being very large and heavy. Since the 1960's various types of battery powered submarines have also been experimented. The thermal energy engine, which Sweden began to experiment in 1971,is also briefly discussed.

AUTHOR: LI Hua [6849 5478]

ORG: None

TITLE: "Making Core With Furan Sand in Hudong"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 24-25

ABSTRACT: Casting is a very important process in manufacturing diesel engines and other instruments in shipbuilding, while casting starts with making sand molds and cores. Originally, the process of making sand molds and cores was dusty and noisy until the technique of mixing quartz sand, catalyst, and furan resin to form furan sand was introduced. This paper describes this new technique, created in foreign countries toward the end of the 1950's, and adopted in the early 1970's by Hudong Shipbuilding Plant. The cost of the resin is very high and the quality requirement for the quartz sand is too strict, however. Furthermore, the sand molds have an irritating odor. Further improvement is needed.

AUTHOR: FU Yilin [3940 0001 2651]

ORG: None

TITLE: "Porpoises and Navy"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 28-29

ABSTRACT: Dolphins or porpoises are marine animals. Their special abilities have always been an important subject for zoologists and scientists of bionics. In recent years, shipbuilding engineers and naval scientists have also become very interested in these abilities. The abilites of these marine mammals , to swim as fast as fifty to sixty km per hour, to submerge under 300 m of water, to "hear" through sonar, etc. are discussed. The author concludes that with training, these marine mammals can be used as "assistants" of the navy, the navigators, and other marine workers.

AUTHOR: TANG Zhiba [0781 1807 2149]

ORG: None

TITLE: "Defense Establishments of the Sea--Talking About Torpedoes"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 33-35

ABSTRACT: Torpedoes are submarine mines. When they are arranged in the water, they form a barrier difficult for the enemy to discover, while when ships of the enemy navigate over them, under the action of various physical fields, they will explode to destroy the under water portion of the ship to cause it to sink or to be otherwise damaged. The paper claims that China, in the middle of the 16th century, was the earliest to invent torpedoes. It was not until more than 200 years later when they began to be used as weapons by European and American countries. This paper introduces the history, the classification, the work principle, and the characteristics of torpedoes. Their future developmental tendencies are also discussed.

AUTHOR: TONG Menghou [4547 1322 0230]

ORG: None

TITLE: "Night Luminescent Pearl of the Sea"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 pp 36-37

ABSTRACT: After dusk, all the ocean is pitch black, except for series of navigation lights, shining like night-luminescent pearls, scattered in the sea to mark the channels for safe sailing of the ships. In China, bulbs used for these navigation lights include incandescent bulbs, neon lights, quartz bromo-tungsten bulbs, and xenon lights. The energy sources for these lights include dry batteries, air batteries, lead acid batteries, silicon solar batteries, and wind powered lights. In 1971 , lighthouses powered by helium neon laser device and capable of being seen as far as three nautical miles away, have been created in foreign countries. Other advanced navigation guidance instruments, recently appearing in foreign countries, also include radar response buoys, tricolor lights, variable intensity lighthouses, etc. These new foreign inventions are only briefly mentioned in the paper.

AUTHOR: (1) SHAO Bolin [6730 2672 2651]
(2) XU Yigen [1776 5030 2704]
(3) Same as (2)
(4) None

ORG: (1) None; (2) None; (3) None; (4) Marine Model Activity Group, Jilin Provincial Military School

TITLE: "(1) Youdian-1 Ocean Floor Cable Laying Ship; (2) Dongfanghong-20 Yangzi Passenger Cruiser; (3) Scenes on a Yangzi Passenger Cruiser; (4) Radio Remote Controlled Helicopter"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 5, Oct 79 front cover, front cover, inside front cover, and inside back cover

ABSTRACT: (1) The upper half of the front cover of this issue is a photo of the ocean floor cable laying ship, Youdian-1; (2) The lower half of the front cover of this issue is a photo of a passenger cruiser of the Yangzi River, the Dongfanghong-20; (3) The inside front cover contains five photos depicting scenes on board a Yangzi passenger cruiser, photographed by the author; (4) The inside back cover contains a photo of a model radio remote controlled helicopter and a drawing of the external view of the helicopter.

6168
CSO: 4009

Silicates

AUTHOR: HUANG Zhenkun /7806 2182 0981/
LIN Zuxiang /2651 4371 9076/
YAN Dongsheng /0917 2639 3932/

ORG: All of Shanghai Institute of Ceramics, Chinese Academy of Sciences

TITLE: "Studies on the Phase equilibrium Relationships and the Crystal Chemistry of R_2O_3 (R:La, Nd, Gd, Ho, Yb)-TiO_2 Systems: II. Crystal Chemistry of R_2O_3 (R:La, Nd, Gd, Ho, Yb)-TiO_2 Systems"

SOURCE: Beijing GUISUANYAN XUEBAO /JOURNAL OF SILICATES/ Vol 7 No 2 May 79 pp 99-104

TEXT OF ENGLISH ABSTRACT: The physical properties of three types of rare-earth titanates (with different R_2O_3:TiO_2 ratios), including the specific gravity, the micro-hardness, the melting point, the lattice constant and the refractive index were determined. Due to the "lanthanide contraction" effect, the lattice constants of 1:2 compounds with pyrochlore structure decrease with rare-earth elements of increasing atomic number. The specific gravities, the micro-hardnesses and the melting points, however, increase in the same series of compounds.

/Continuation of GUISUANYAN XUEBAO, Vol 7, No 2, May 79, pp 99-104/

The birefringence of the compounds of the same type tends to decrease with smaller rare-earth elements indicating that the structure is assuming greater symmetry and approaching equiaxed crystalline structure.

The general trends of the phase relationships of the five binary systems were discussed. The decreasing ability of titanate formation from light to heavy rare-earth ions was described. These trends are considered to be related to the similarity and the gradual transition of the properties of the rare-earth oxides, including their chemical properties, the radii of cations, their bonding properties, etc.

The formation of the pyrochlore solid solution in R_2O_3-TiO_2 systems was compared with that in R_2O_3-ZrO_2 systems. The conditions of formation and the range of stability of P-type solid solutions are closely related with the sizes of the metallic ionic radii. $r_{R^{3+}}/r_{Ti^{4+}} \leq 1.35$, for the formation of P-type solid solution in the R_2O_3-TiO_2 systems, was defined.

Received 1 September 1978.

AUTHOR: LI Jiazhi /2621 1367 3112/
CHEN Xianqiu /7115 7359 3061/
DENG Zequn /6772 3419 5028/
GU Zujun /6253 4371 0193/

ORG: All of Shanghai Institute of Ceramics, Chinese Academy of Sciences

TITLE: "A Study of the Pottery Unearthed at Homudu"

SOURCE: Beijing GUISUANYAN XUEBAO /JOURNAL OF SILICATES/ Vol 7 No 2 May 79 pp 105-112

TEXT OF ENGLISH ABSTRACT: The authors have studied the pottery of the four layers of cultural deposits excavated at Homudu, Yuyao County, Zhejiang Province. According to the results obtained from the research of chemical compositions, micro-structures, firing temperatures and physical properties of these potteries, it reveals that these excavated potteries dated as far back as seven thousand years ago in the fourth layer possess the distinguished characteristics which have never been found before

1. The mixed carbon black wares excavated in large quantities were made of a kind of clay containing sericite intentionally mixed up with carbonized rice husks, stalks and leaves which were burnt beforehand.

/Continuation of GUISUANYAN XUEBAO, Vol 7, No 2, May 79, pp 105-112/

1. The Fe_2O_3 contents of the potteries excavated from the fourth layer, irrespective of mixed carbon black wares or sandy black wares are very low (1.5~1.8%). This has never been found at any other excavated neolithic sites in China and even also at other layers at Homudu. Possibly it relates to the higher purity of raw materials being used.

3. Such potteries (particularly those from the fourth layer) mark a high ignition loss up to 13.42% due to carbon and organic materials contained therein.

From the variation of composition and the development of technology of the potteries excavated at Homudu, we can get a clear view of the relationship among the four layers of cultural deposits superimposed one upon the other. This may offer some worthy references for the archaeologists.

The chemical analysis data used in the paper were provided by the Seventh Laboratory, Shanghai Institute of Ceramics and colleague ZHOU Xueqin /0719 7185 3830/ also took part in the work.

Received 9 December 1978.

AUTHOR: WANG Yansheng [3769 1693 3932]
YOU Baokun [3266 1405 0981]
ZHANG Guiqing [1728 2710 3237]
DENG Shencao [6772 1957 2347]

ORG: All of the Cement Research Division, Research Institute of Building Materials

TITLE: "Properties of Alunite Expanding Cement and Its Hydration and Hardening"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 113-126

TEXT OF ENGLISH ABSTRACT: The present work deals mainly with alunite expanding cement, its technical requirements and hydration behaviors. Portland cement is the matrix of the cement while natural alunite which is used in place of calcined alunite is the expanding component, and flyash or blast furnace slag is the expanding stabilizer. Expansion, strength, self-stressing, permeability and fracture characteristics of the alunite are described. According to XRD, DTA and EM results, the characteristics of this cement in hardening process are discussed.

This paper was read at the 1978 annual conference of Shanghai Municipality

[Continuation of GUISUANYAN XUEBAO, Vol 7, No 2, May 79, pp 113-126]

Ceramics Society, China Ceramics Society. TANG Jinshu [0781 6855 2885] and LIU Yinyue [0491 0603 2588] also took part in the research work. The authors thank Chief Engineer WU Zhongwei [0702 0022 0251] and engineers WEI Yunfeng [7614 0663 6912] and TAI Liankui [1132 6647 1145] for their opinions.

AUTHOR: CHEN Xianqiu [7115 7359 3061]
JIANG Lingzhang [1203 6875 4545]
CHEN Shiping [7115 1102 5493]

ORG: All of Shanghai Institute of Ceramics, Chinese Academy of Sciences

TITLE: "Measurements of the Refractive Index Profile of Optical Glass Fiber"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 127-137

TEXT OF ENGLISH ABSTRACT: In this paper two approaches, namely, double beam technique and interference-snearing method, are presented to the measurement of refractive index profile in glass fiber by means of interference microscope. The general principle, apparatus and measuring procedures are described, and then experimental results of curves of refractive index profile of several samples of individual preforms and fiber are given and discussed.

This paper was discussed at the All China Optical Fiber Measuring and Experimentation Conference. GU Zujun [6253 4371 0193], CHEN Peiqi [7115 0160 3825], and SHAO Kangqing [6730 1660 3237] also took part in the work. The authors thank ZHANG Yinghua [1728 5391 5478] and WANG Jianguo [3769 1696 0948] for providing samples; ZHANG Meifang [1728 5019 5364] in grinding and making all drawn-

[Continuation of GUISUANYAN XUEBAO, Vol 7, No 2, May 79, pp 127-137]

wire used; and the Shanghai Equipment Company and Equipment Division of the Shanghai Institute of Ceramics for timely providing key equipment. The paper was received for publication on 1 August 1978.

AUTHOR: YU Shanqing [0205 0810 1987]
LI Baozhen [2621 5508 4176]
CHEN Yaocheng [7115 1031 2052]
XU Weizhen [1776 4850 4518]

ORG: All of Shanghai Institute of Ceramics, Chinese Academy of Sciences

TITLE: "Oxidation Resistant Coatings of Non-Oxide Compounds Sintered on Molybdenum"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 138-149

TEXT OF ENGLISH ABSTRACT: Oxidation resistant coatings of non-oxide compounds were sintered on molybdenum by melting process under vacuum or inert atmospheres. It is a new development in coating techniques. This paper summarizes the research work of different non-oxide systems, including B-Mo-Si, B-Cr-Si, Ti-Mo-Si (5% B), Cr-Mo-Si (0.59% Ti, 0.59% Fe, 0.20% Al), especially on the high temperature property of W-Mo-Si (5% B) system, such as 10% W-10% Mo-80% Si (5% B). The experimental results show that these coatings have excellent properties and can be used at high temperature for protecting molybdenum promisingly.

Received 25 September 1978.

AUTHOR: GAN Fuxi [1626 4395 3588]

ORG: Shanghai Institute of Precision Optical Machines, Chinese Academy of Sciences

TITLE: "Problems on the Structure and Properties of Inorganic Glassy Materials"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 150-163

ABSTRACT: Generally, the structure of inorganic crystals is relatively simple, with well known properties, so quite a few researchers study the structure and properties of noncrystalline substances. In recent years, many research results were gained about the structure and properties of inorganic glassy materials. This paper is a continued discussion of the following problems: (1) formation of inorganic glassy materials, (2) structure characteristics and analysis method of the inorganic glassy materials, (3) relationships of glass structure, its properties, and components, and (4) phase splitting phenomenon and its effect on glass properties.

Received 12 December 1978.

AUTHOR: GUO Zhukun [6753 4376 2492]
LI Xiangting [2621 7449 1656]

ORG: Both of Shanghai Institute of Ceramics, Chinese Academy of Sciences

TITLE: "Thermodynamic Calculation of Chemical Reactions Between Sodium and Oxide Components (Including Oxide Impurities) in beta-Alumina Ceramics"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 164-167

ABSTRACT: While using beta-alumina ceramics as in partitions for solid electrolyte, electrolytic metallic sodium deposition can exist among crystal lattices or particles. Reductions between sodium and beta-alumina or between sodium and oxide impurities play an important role in sodium deposition within ceramics or can change after deposition. Relying on the above-mentioned reduction trend calculated thermodynamically, this paper examines the effect of reduction on sodium deposition. Two areas are discussed: the reducing reactions between sodium and oxide system and the effect of dissolved oxygen in liquid metallic sodium.

Received 22 December 1978.

AUTHOR: None

ORG: Oil-Well Cement Group, Cement Research Division, Research Institute of Building Materials

TITLES: "Super-abysmal Oil-Well Cement With Low Specific Gravity"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 168-177

ABSTRACT: While cement mortar solidifies an oil or gas well, its pressure against the pump increases with increasing specific gravity of the cement mortar. If the pressure exceeds the minimum stratal fracturing strength, the rock formations will be fractured not only causing cement mortar leakage losses but also possibly failing in solidifying the oil well. This paper specifies the raw materials and components of low-specific-gravity cement for super-abysmal oil well as well as the grinding method and technical parameters of cement. Properly compounded sand-containing cement with diatomaceous earth can meet the technical requirements. An adequate high-temperature slow solidifying agent should be mixed with the cement to solidify wells of 150 to 200°C; d-tartaric acid and the compounding agent of d-tartaric acid and boric acid are effective high-temperature slow solidifying agents.

Received 29 August 1978.

AUTHOR: SHEN Rongxi [3088 2837 3588] et al.

ORG: Fiber Cement Group, Research Institute of Cement Products, Shandong Province

TITLE: "An Effective Way of Preventing Corrosion of Glass Fibers by Cement Matrices"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 pp 178-181

ABSTRACT: Assuming that glass fibers in cement matrices are simultaneously subjected to chemical corrosion and stress corrosion, the paper maintains that surface protection of glass fibers is an effective way of preventing corrosion. Particularly recommended is a polymer emulsion of zinc salt for effective covering of glass fiber. A comparison is made with zirconium-containing glass fibers. Only by effectively protecting the fiber surface is it possible to use ordinary glass fiber and a silicate-system cement for blending into a durable compounding material.

Received 14 February 1979.

AUTHOR: None

ORG: JOURNAL OF SILICATES

TITLE: "China Ceramics Society Actively Develops Its Activities"

SOURCE: Beijing GUISUANYAN XUEBAO [JOURNAL OF SILICATES] Vol 7 No 2 May 79 p 182

ABSTRACT: Since convening of the 1978 annual conference of the China Ceramics Society at Shanghai in December 1978, the society and its professional committees as well as local ceramics societies have developed their activities. The society's board of directors was formally restored at the 1978 Annual Conference. In addition, ten professional committees were established; before January and April 1979 reported activities of the professional committees included nonmetallic ore, crystal growth and materials, construction materials, cement, cement products and electric vacuum glass. Preparatory meetings of the ceramic and special ceramic professional committees were held. Related professional societies in Japan and the United States were contacted. Up to the end of May 1979, ceramics societies were established in 22 provinces, municipalities and regions.

10424
CSO: 4009

END

END OF

FICHE

DATE FILMED

30 JAN '80

MAK